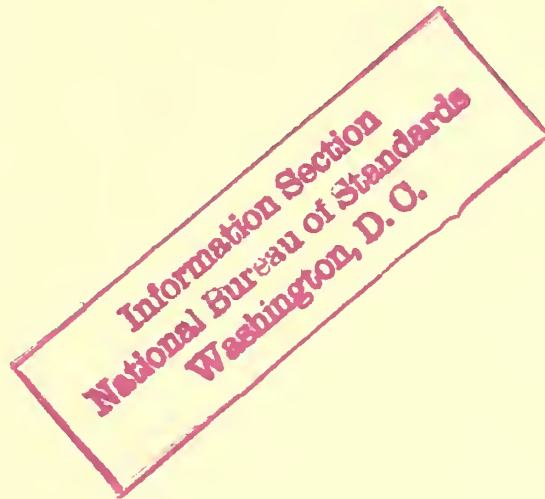


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Circular C385)

REVISED CLASSIFICATION OF RADIO SUBJECTS USED
IN NATIONAL BUREAU OF STANDARDS

January 11, 1946

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REVISED CLASSIFICATION OF RADIO SUBJECTS USED
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	Page
I. Introduction	1
II. The Dewey Decimal System of Classification	2
III. Classification of Radio Subjects	3
IV. Revised Classification of Radio Subjects	4
Classification Outline Index	4
R000 General Radio Material	4
R100 Radio Principles	5
R200 Radio Measurements and Standardization	15
R300 Radio Apparatus and Equipment	19
R400 Radio Communication Systems	28
R500 Applications of Radio	29
R600 Radio Stations: Equipment, Regulations, Design, Operation, Maintenance and Management	32
R700 Radio Manufacturing and Repairing	33
R800 Nonradio	33
V. Subject Index	37

I. Introduction

The present pamphlet is an expansion and revision of Bureau of Standards Circular C385, "Classification of Radio Subjects - An Extension of the Dewey Decimal System," published in 1930. The latter, in turn, was a revision of the Bureau's Circular C138, published in 1923. As indicated in the title of Circular C385, the classification was an extension of the general Dewey Decimal System, prepared by Doctor Melvin Dewey for classifying books, publications, references, and other material as found in reference and public libraries. The Dewey Classification at that time did not include a detailed classification for radio, and the Bureau's Circular C385 was designed to fill the need of organizations desiring a classification table covering radio science. The classification presumably could be expanded in any part where the user found it desirable to further subdivide a given topic. This possibility was not followed at the Bureau, so that as the years passed and hundreds of new topics appeared, it became difficult to file new references according to Circular C385. A revised classification was accordingly prepared.

II. The Dewey Decimal System of Classification

Under the Dewey decimal system, classification is by subject, numbers being used to show the relative positions of the books, cards, or other material. The numbers, therefore, show both what the material is (that is, its subject matter), and where the material is (that is, its location on the shelves or in the files). In the classification list the indentation and the figures prefixed to each item show the rank of each subject in the classification.

Accompanying the extended classification is an alphabetical index. The index is used in determining the number to assign to a given item or material, or to learn where to place it in the files. The index is also used by any person desiring to locate the material covering a given subject. The reference number tells immediately where all material on that and on related subjects can be found.

The whole subject of radio is given the number 621.38⁴ in the Dewey classification. The relation of this place to the general field of knowledge is shown by the following table:

Class	600	Useful arts
	20	Engineering
	1	Mechanical
	0.300	Electrical
	.080	Communication
	.004	Radio

In a strictly radio library or office it is convenient to represent the figure 621.38⁴ by "R" and this abbreviation is used below in the further classification of radio. Thus, R211 indicates 621.38⁴.211.

III. Classification of Radio Subjects

In the classification of radio subjects the main features of the Dewey system as to subject and form classification are retained.

The class (R800) is anomalous. This space in the classification is actually used for nonradio subjects. Such material should, however, be given its regular class number according to the Dewey system. If it were arranged in strictly numerical order, some of this material would come before radio and some after radio. By choosing arbitrarily to use the space denoted by R800 for this purpose it is possible to arrange the nonradio material in classified order, but to keep it subordinate to a large volume of radio material. Accordingly, a number of nonradio items are included where R800 comes in the list under Section V below, but are given their number according to the complete classification.

In filing a specific paper under a given class or subdivision, a convenient file number for it can readily be made by using its subject classification number plus a small letter; the order chosen for the

letters used for subsequent papers can be according to author, chronological order of accession, or any other consideration depending on the circumstances.

In a card file of references to periodical literature, it is convenient to arrange the cards under each final class or subdivision either in chronological order or in alphabetical order by the names of authors. Cross references may be made conveniently in such a card file by preparing two or more cards and marking each card, after the file number, "X_____". For example, suppose an article on fading (R113.1) includes a method of measuring field intensity by the calibrated loop antenna method (R271.11); two cards should be made out, one marked R113.1 XR271.11 and the other R271.11 XR113.1.

The needs of individual collections of files vary widely, and expansions of the system can be made by any person using the system.

The former Circular was arranged so that the numbers used indicated the type of article, i.e., whether dealing chiefly with general radio material, radio principles, measurements, apparatus, communication systems, applications, stations, manufacturing, or nonradio subjects, as shown by number in the groups R000, R100, R200, R300, R400, R500, R600, R700, and R800*, respectively. This arrangement brought in a certain amount of duplication, particularly in the R100, R200, and R300 groups. Other difficulties were experienced in use; for example, it was found necessary to file some theoretical articles under the R300 group, and some descriptive articles under the R100 group, because of lack of classification numbers in the desired group.

In the revised classification the same general outline of the different hundreds groups has been used, but in certain sections numbers close together provide for theory, apparatus, and procedure. Likewise, the R100 group does not provide for theoretical articles on every subject and item in the table, so that if the reference relates to theory of an item found only in the R300 group, it must be filed under that number.

In order to overcome some of these inconsistencies, it appeared that a complete change would have to be made in the classification. This seemed undesirable because of the work involved in making a complete new system, and the work required to change files made in accordance with Circular C385 to agree with a new system. The changes made in the numbering have not been numerous, and it is hoped that users of the revised classification will not have difficulty.

It is expected that additions to the present system will be made (1) from suggestions received by users, (2) as the need develops, and (3) as secret material becomes unclassified.

*The numbers in this group were taken directly from the Dewey Classification Tables and appeared with the numbers as given by Dewey, with a few additions.

The present revision, although based on Bureau of Standards Circular C385, which in turn was based upon the twelfth edition, 1927, of Doctor Melvin Dewey's book "Decimal Classification and Relative Index for Libraries, Clipping Notes, etc.", should not be confused with the fourteenth edition, 1942, of that book, which has devoted some space to radio. The subjects covered in that edition have numbers differing from those assigned in this Circular.

A preliminary draft of the present classification table was sent to a number of persons and organizations for suggestions. No index was provided with that draft so that it was quite difficult to determine whether particular items were included or not. The cooperation of those who gave suggestions for the present classification is gratefully acknowledged. The bureau will appreciate further suggestions on this revision.

IV. Revised Classification of Radio Subjects

RO00	RADIO. (Material of a general nature for which no specific classification can be used and which relates to the field as a whole.)
RO00.1	.....Developments in other countries.
RO01	.....Statistics.
RO04	.....Design.
RO05	.....Executive; administrative; personnel.
RO07	.....Laws; regulations.
RO07.9	.....International radio conferences; treaties.
RO09	.....Reports; bulletins.
RO10	....Research.
RO20	....Standards.
RO30	....Terminology.
RO31	.....Symbols.
RO32	.....Definitions.
RO40	....Lectures.
RO50	....Publications.
RO51	.....Specifications.
RO52	.....Textbooks.
RO53	.....Periodicals.
RO55	.....Bibliographies.
RO60	....Societies; meetings.
RO70	....Education; training.
RO71	.....Engineer's relations with public.
RO72	.....Research laboratories; experiment stations.
RO74	.....Museums; exhibits.
RO76	.....Accessories; slide rules; calculators.
RO80	....Collections; miscellanies.
RO81	.....Tables.
RO82	.....Nomograms; abacs.
RO84	.....Maps and charts.
RO90	....History; reviews.
RO91	.....Radiotelegraphy.
RO94	.....Radiotelephony.
RO94.1	.....Transmission.

R094.2	.....Reception.
R095	.....Television.
R096	.....Facsimile.
R097	.....Biographical.
R100	..RADIO PRINCIPLES. (Material having to do with underlying theory.)
R110	....Radio Waves (propagation phenomena and theory; atmospherics).
R111	.....Theory (includes propagation at highest frequencies used).
R111.1	.....Velocity of radio waves.
R111.2	.....Radiation.
R111.6	.....Reception.
R112	.....Radio wave propagation (See also R113).
R112.1	.....Ground-wave propagation.
R112.11	.....Direct-wave propagation.
R112.111	.....Refraction of ground wave.
R112.112	.....Propagation of ground wave through ground and sea.
R112.12	.....Surface-wave propagation.
R112.121	.....Surface-wave propagation over land path.
R112.122	.....Surface-wave propagation over sea path.
R112.123	.....Surface-wave propagation over mixed land and sea paths.
R112.124	.....Surface-wave propagation through jungles.
R112.125	.....Surface-wave diffraction.
R112.126	.....Surface-wave polarization.
R112.127	.....Surface-wave tilt.
R112.13	.....Ground-reflected wave propagation.
R112.131	.....Ground reflection coefficients.
R112.131.1	.....Brewster's angle.
R112.132	.....Ground constants.
R112.133	.....Antenna vertical patterns.
R112.14	.....Height-gain function for ground-wave propagation.
R112.15	.....Multipath transmission of ground wave.
R112.16	.....Absorption of ground wave in atmosphere.
R112.2	.....Tropospheric-wave propagation.
R112.21	.....Standard refraction of tropospheric wave.
R112.22	.....Reflection of tropospheric wave from atmospheric inversions.
R112.23	.....Superrefraction (anomalous propagation) of tropospheric wave.
R112.24	.....Atmospheric absorption of tropospheric wave.
R112.25	.....Effect of meteorological fronts on tropospheric wave.
R112.26	.....Meteorology of lower atmosphere as affecting tropospheric wave propagation.
R112.27	.....Height-gain function for tropospheric wave propagation.
R112.3	.....Guided-wave propagation.
R112.31	.....Guided-wave propagation at very low frequencies.
R112.32	.....Guided-wave propagation at low frequencies.
R112.33	.....Modes of guided-wave propagation.

R112.4	.....Sky-wave propagation.
R112.41	.....Ionosphere.
R112.42	.....Reflection and refraction of sky wave.
R112.43	.....Modes of sky-wave propagation.
R112.5	.....Skip distance and maximum usable frequency (muf).
R112.51	.....Oblique-vertical incidence relations for maximum usable frequency.
R112.52	.....Maximum usable frequency (muf).
R112.521	.....Maximum usable frequency by regular layers.
R112.522	.....Maximum usable frequency by irregular or sporadic reflection.
R112.523	.....Maximum usable frequency by long scatter.
R112.524	.....Maximum usable frequency by short scatter.
R112.525	.....Maximum usable frequency as affected by bursts.
R112.526	.....Maximum usable frequency as affected by spread echoes.
R112.53	.....Calculation of maximum usable frequency.
R112.531	.....Calculation of maximum usable frequency for single- hop propagation.
R112.532	.....Calculation of maximum usable frequency for multi- hop propagation.
R112.54	.....Prediction of maximum usable frequency.
R112.55	.....Transmission above maximum usable frequency.
R112.6	.....Sky-wave field intensities.
R112.61	.....Unabsorbed sky-wave field intensity.
R112.62	.....Ionospheric absorption of sky-wave field intensity.
R112.621	.....Ionospheric absorption of sky-wave field intensity for short distances.
R112.622	.....Ionospheric absorption of sky-wave field intensity for medium distances.
R112.623	.....Ionospheric absorption of sky-wave field intensity for long distances.
R112.624	.....Oblique-vertical incidence relations for iono- spheric absorption.
R112.63	.....Sky-wave field intensity variations.
R112.631	.....Diurnal variations of sky-wave field intensity.
R112.632	.....Seasonal variations of sky-wave field intensity.
R112.633	.....Long-time variations of sky-wave field intensity.
R112.64	.....Prediction of sky-wave field intensities.
R112.65	.....Radiated power as affecting sky-wave field intensity.
R112.7	.....Propagation of atmospheric radio noise.
R112.71	.....Source of atmospheric radio noise.
R112.72	.....Diurnal variations of atmospheric radio noise.
R112.73	.....Geographical variations of atmospheric radio noise.
R112.74	.....Frequency variations of atmospheric radio noise.
R112.75	.....Seasonal variations of atmospheric radio noise.
R112.751	.....Atmospheric radio noise grades.
R112.76	.....Required radio field intensities.
R112.761	.....Atmospheric noise as affecting required radio field intensity.
R112.762	.....Receiving set noise as affecting required radio field intensity.
R112.763	.....Directional properties of antennas as affecting required radio field intensity.

R112.8	.....Lowest useful high frequency (luhf).
R112.9	.....Polarization of sky waves.
R112.91	.....Ordinary-wave polarization.
R112.92	.....Extraordinary-wave polarization.
R112.93	.....Downcoming-wave polarization.
R112.94	.....Ground reflection phenomena.
R112.95	.....Effect of ionosphere on polarization.
R113	.....Radio wave propagation (continued), (See also R112).
R113.1	.....Fading.
R113.101	.....Interference fading.
R113.102	.....Polarization fading.
R113.103	.....Absorption fading.
R113.103.1	.....Sudden ionosphere disturbances.
R113.104	.....Flutter fading.
R113.105	.....Skip fading.
R113.106	.....Sunrise-sunset fading.
R113.107	.....Selective fading.
R113.108	.....Rayleigh distribution of field intensities.
R113.109	.....Scintillations of field intensities.
R113.110	.....Multipath transmission fading.
R113.111	.....Shadows of objects.
R113.2	.....Propagation variations.
R113.21	.....Skip distance and maximum usable frequency (muf).
R113.211	.....Diurnal variations.
R113.212	.....Seasonal variations.
R113.213	.....Latitude variations.
R113.214	.....Longitude variations.
R113.215	.....Annual variations.
R113.216	.....Solar cycle variations.
R113.217	.....Random variations.
R113.218	.....Prediction of skip distance and muf.
R113.22	.....Field intensity and ionospheric absorption.
R113.221	.....Diurnal variations of field intensity and ionospheric absorption.
R113.222	.....Seasonal variations of field intensity and ionospheric absorption.
R113.223	.....Latitude variations of field intensity and ionospheric absorption.
R113.224	.....Longitude variations of field intensity and ionospheric absorption.
R113.225	.....Annual variations of field intensity and ionospheric absorption.
R113.226	.....Solar cycle variations of field intensity and ionospheric absorption.
R113.227	.....Random variations of field intensity and ionospheric absorption.
R113.228	.....Prediction of field intensity and ionospheric absorption.
R113.23	.....Tropospheric wave variations.
R113.230.1	.....Diurnal variations of tropospheric wave.
R113.230.2	.....Seasonal variations of tropospheric wave.

R113.230.3	.....	Latitude variations of tropospheric wave.
R113.230.4	.....	Longitude variations of tropospheric wave.
R113.230.5	.....	Annual variations of tropospheric wave.
R113.230.6	.....	Solar cycle variations of tropospheric wave.
R113.230.7	.....	Random variations of tropospheric wave.
R113.230.8	.....	Prediction of tropospheric wave variations.
R113.230.9	.....	Standard refraction of tropospheric wave.
R113.231.0	.....	Superrefraction of tropospheric wave.
R113.231.1	.....	Atmospheric absorption of tropospheric wave.
R113.231.2	.....	Metecrological effects on tropospheric wave.
R113.24	.....	Irregularities of radio wave propagation.
R113.241	.....	Sudden ionosphere disturbances.
R113.242	.....	Scatter.
R113.242.1	.....	Short scatter.
R113.242.2	.....	Long scatter.
R113.242.3	.....	Auroral zone scatter.
R113.243	.....	Ionosphere storms.
R113.244	.....	Sporadic E reflection.
R113.245	.....	Cross modulation in ionosphere.
R113.246	.....	Cross modulation of radio waves by objects.
R113.3	.....	Directional variations of radio wave propagation.
R113.301	.....	Non-great-circle propagation.
R113.302	.....	Vertical angles of arrival.
R113.303	.....	Heiligtag effect.
R113.304	.....	Direction-finder errors.
R113.305	.....	Ionosphere layer tilt.
R113.306	.....	Reflections from ionosphere clouds.
R113.307	.....	Reflections from objects.
R113.308	.....	Scattering.
R113.309	.....	Auroral-zone reflections.
R113.4	.....	Solar and cosmic effects on radio wave propagation.
R113.401	.....	Normal ionizing radiation effect on radio wave propagation.
R113.402	.....	Sunspots effect on radio-wave propagation.
R113.403	.....	Solar-cycle variations.
R113.404	.....	Solar corona.
R113.405	.....	Solar flocculi and faculae.
R113.406	.....	Solar prominences.
R113.407	.....	Solar flares.
R113.408	.....	Ultra-violet radiation from sun, effect on radio wave propagation.
R113.409	.....	Corpuscular radiation from sun, effect on radio wave propagation.
R113.409.1	.....	Charged corpuscles from sun, effect on radio wave propagation.
R113.409.2	.....	Neutral corpuscles from sun, effect on radio wave propagation.
R113.410	.....	Lunar effects on radio wave propagation.
R113.411	.....	Solar radio noise.
R113.412	.....	Eclipses.
R113.413	.....	Cosmic radiation, effect on radio wave propagation.
R113.414	.....	Cosmic noise.
R113.415	.....	Meteors and meteoric matter.

R113.5Geophysical effects on radio wave propagation.
R113.501Meteorological effects on radio wave propagation.
R113.501.1Meteorological effects on tropospheric propagation.
R113.501.2Meteorological effects on atmospheric radio noise.
R113.501.3Meteorological effects on ionosphere.
R113.502Constitution of atmosphere.
R113.502.1Ionization processes in atmosphere.
R113.502.2Recombination processes in atmosphere.
R113.502.3Light of night sky.
R113.502.4Causes of ionosphere layer formation.
R113.502.41Ozone layer of atmosphere.
R113.502.42D layer of atmosphere.
R113.502.43E layer of atmosphere.
R113.502.44F1 layer of atmosphere.
R113.502.45F2 layer of atmosphere.
R113.502.46Sporadic-E layer of atmosphere.
R113.502.49Other layers of atmosphere.
R113.503Ionosphere storms.
R113.503.1Auroral zone.
R113.503.2Auroras.
R113.503.3Magnetic storms.
R113.503.4Earth current variations.
R113.503.5Radio propagation disturbances.
R113.503.6Recurrence effects.
R113.504Sudden ionosphere disturbances.
R113.505Latitude variations of ionosphere.
R113.506Longitude variations of ionosphere.
R113.507Geomagnetic variations of ionosphere.
R113.508Magne-to-ionic effects on ionosphere.
R113.509Ground constants.
R113.509.1Ground reflection coefficients.
R113.6Ionosphere.
R113.601Description of ionosphere.
R113.602Characteristics of ionosphere.
R113.602.1Critical frequency of ionosphere.
R113.602.2Heights of ionosphere.
R113.602.21Virtual height of ionosphere.
R113.602.22Actual height of ionosphere.
R113.602.3Ion distribution in ionosphere.
R113.602.4Reflection coefficients of ionosphere.
R113.602.5Maximum usable frequencies (muf) and skip distance.
R113.602.6Maximum usable frequency factors.
R113.602.7Absorption and reflection coefficients.
R113.602.8Lowest usable high frequency (luhf).
R113.602.9Polarization.
R113.603F1 layer of ionosphere.
R113.604F2 layer of ionosphere.
R113.605E layer of ionosphere.
R113.606E2 layer of ionosphere.
R113.607D layer of ionosphere.
R113.608Sporadic-E layer of ionosphere.

- R113.609Sporadic E2 layer of ionosphere.
- R113.610Stratification of ionosphere.
- R113.611Other layers of the ionosphere.
- R113.612Polar spur on ionosphere records.
- R113.613Magneto-ionic effects on ionosphere.
- R113.613.1Magneto-ionic effects on ordinary wave propagation.
- R113.613.2Magneto-ionic effects on extraordinary wave propagation.
- R113.613.3Magneto-ionic effects on "Z" wave propagation.
- R113.614Gyrofrequency for radio waves.
- R113.615Normal variations of ionosphere.
- R113.615.1Diurnal variations of ionosphere.
- R113.615.2Seasonal variations of ionosphere.
- R113.615.3Solar cycle variations of ionosphere.
- R113.615.4Latitude variations of ionosphere.
- R113.615.5Longitude variations of ionosphere.
- R113.615.6Random day-to-day variations of ionosphere.
- R113.616Predictions of ionosphere conditions.
- R113.616.1Critical frequencies of ionosphere.
- R113.616.2Heights of ionosphere.
- R113.616.3Muf and skip distance for sky-wave propagation.
- R113.616.4Absorption in sky-wave propagation.
- R113.616.5Luhf for sky-wave propagation.
- R113.617Anomalies and disturbances of ionosphere.
- R113.617.1Ionosphere storms.
- R113.617.2Forecasting of ionosphere storms.
- R113.617.3Sudden ionosphere disturbances.
- R113.617.4Lower layer absorption.
- R113.617.5Scatter.
- R113.617.51Long scatter.
- R113.617.52Short scatter.
- R113.617.53Auroral zone scatter.
- R113.617.6Bursts in ionosphere.
- R113.617.7Spread echoes from ionosphere.
- R113.617.8Ionosphere layer tilt.
- R113.7Calculation of propagation conditions.
- R113.71Handbooks on propagation conditions.
- R113.72Sets of graphs on propagation conditions.
- R113.73Nomograms on propagation conditions.
- R113.74Tables on propagation conditions.
- R113.75Transmission formulas and radio propagation.

Add following numbers to any of classes of R113.7 group to indicate frequency ranges. (Example, R113.721 Set of graphs for very low frequencies.)

- R113
 - .001Very low frequencies (below 30 kc).
 - .002Low frequencies (30 to 300 kc).
 - .003Medium frequencies (300 to 3000 kc).
 - .004High frequencies (3000 to 30,000 kc).
 - .005Very high frequencies (30 to 300 Mc).
 - .006Ultra-high frequencies (300 to 3000 Mc).
 - .007Super-high frequencies (3000 to 30,000 Mc and above).

- R114.Atmospheric radio noise
- R114.1Atmospheric radio noise sources.
- R114.11Diurnal variations in atmospheric radio noise.
- R114.12Seasonal variations in atmospheric radio noise.
- R114.13Geographical variations in atmospheric radio noise.
- R114.14Meteorological variations, effect on atmospheric radio noise.
- R114.2Propagation of atmospheric radio noise.
- R114.3Calculation of atmospheric radio noise.
- R114.4Prediction of atmospheric radio noise.
- R114.5Precipitation radio noise.
- R114.6Whistlers.
- R114.7Required field intensities to overcome atmospheric radio noise.
- R114.8Effects of receiving antennas on atmospheric radio noise.
- R115Directional properties of radio waves.
- R115.1Great-circle path calculations of radio waves.
- R115.11Distance calculations.
- R115.12Bearing and azimuth calculations.
- R115.2Non-great-circle path propagation of radio waves.
- R115.21Ionosphere layer tilt effect on propagation.
- R115.22Reflections of radio waves from ionosphere clouds.
- R115.23Reflections of radio waves from objects.
- R115.24Long scatter of radio waves.
- R115.25Short scatter of radio waves.
- R115.26Auroral scatter of radio waves.
- R115.3Bearing deviations of radio waves.
- R115.31Long-route bearings.
- R115.32Scatter as cause of bearing deviations.
- R115.33Ionosphere storm effects on bearing deviations.
- R115.34Sporadic-E effects on bearing deviations.
- R115.35Heiligtag effects on bearing deviations.
- R115.36Polarization effects on bearing deviations.
- R115.361Night effects on bearings.
- R115.4Vertical angles of arrival of radio waves.
- R115.5Ground reflection effects of radio waves.
- R115.6Radio wave tilt.
- R115.7Polarization effects on directional properties of radio waves.
- R116Radar principles.
- R117Waves on wires; transmission lines; parallel wires or concentric conductors.
- R117.1Properties of transmission lines.
- R117.11Conduction of r-f and a-f by transmission lines.
- R117.111Non-resonant lines.
- R117.112Resonant lines.
- R117.12Impedance and impedance matching.
- R117.121Impedance matching by network.
- R117.122Impedance matching by resonant line coupling.
- R117.123Impedance matching by quarter-wave coupling line.
- R117.124Impedance matching by stub-line.
- R117.125Impedance matching by reentrant transmission line section.

- R117.13Irregularities in transmission lines.
- R117.14Balanced and unbalanced lines.
- R117.15Radiation from transmission lines.
- R117.16Loaded lines.
- R117.17Tapered lines.
- R117.18Pressurizing r-f lines.
- R117.2High-frequency cable.
- R118Wave guides.
- R118.1Rectangular wave guides.
- R118.2Nonrectangular wave guides.
- R118.3Transverse magnetic waves, TM or E.
- R118.4Transverse electric waves, TE or H.
- R118.5Cut-off frequency of wave guides.
- R118.6Excitation of modes of wave guides.
- R118.7Attenuation of wave guides.
- R119Cavity resonators.
- R119.1Nonreentrant-type cavity resonator.
- R119.2Reentrant-type cavity resonator.
- R119.3Properties of cavity resonators.
- R119.31Modes of oscillation of cavity resonator.
- R119.32Resonance frequency of cavity resonator.
- R119.33Q of cavity resonator.
- R119.34Impedance of cavity resonator.
- R119.35Coupling to cavity resonator.
- R119.39Other properties of cavity resonators.
- R120Antennas (See also R320).
- R120.1Vertical directional patterns of antennas.
- R120.11Ground reflection as affecting vertical directional patterns of antennas.
- R120.2Radiation efficiency of antennas.
- R120.21Radiated power from antennas.
- R121Condenser type antennas (ordinary elevated type) with ground or the usual type counterpoise.
- R122Linear antennas - not connected to ground or to the ordinary type of counterpoise.
- R125Directional antennas (transmitting in, or receiving from, a particular direction).
- R125.1Beam antennas, antenna arrays.
- R125.2Wave antennas.
- R125.3Coil antennas.
- R125.31Direction-finding antennas.
- R125.4Adcock antennas.
- R125.5Transmission-line antennas.
- R125.6Vertically radiating antennas.
- R125.61Resonant radiating antennas.
- R125.62Nonresonant radiating antennas.
- R125.7High-angle antennas for short-distance work.
- R125.8Low-angle antennas for long-distance work.
- R126Ground systems.
- R127Image antennas.
- R128Feeders for antennas (transmission lines, etc.).
- R129Other types of antennas (quarter-wave antennas; half-wave antennas).

R129.1	.....Multiple-tuned antennas.
R130	....Vacuum tubes.
R131	.....General properties; characteristic curves of vacuum tubes.
R132	.....Amplifying action of vacuum tube; amplifier theory.
R133	.....Generating action of vacuum tube.
R133.1	.....Generating action of vacuum tube with negative grid.
R133.2	.....Generating action of vacuum tube with positive grid.
R133.3	.....Generating action of vacuum tube, relaxation oscillation.
R134	.....Detector action of vacuum tube.
R135	.....Modulating action of vacuum tube.
R136	.....Trigger action in vacuum tube.
R138	.....Electron emission; ionization; electron theory.
R138.1	.....Space charge effects in vacuum tube.
R138.2	.....Shot effect.
R138.3	.....Electron optics.
R138.31	.....Cathode-ray tubes.
R138.311	.....Electron gun.
R138.312	.....Deflection of electron beam.
R138.313	.....Fluorescent screen.
R138.4	.....Electron oscillations.
R138.5	.....Electron transit-time.
R139	.....Other vacuum-tube principles.
R139.1	.....Vacuum-tube circuit analysis.
R139.2	.....Special vacuum-tube circuit arrangements.
R139.21	.....Cathode follower circuit.
R140	....Circuit theory and effects; transient effect; relaxation oscillations; parasitic oscillations.
R141	.....Simple radio circuits.
R141.1	.....Frequency of radio circuit.
R141.2	.....Resonance, tuning of radio circuit.
R141.21	.....Series resonance of radio circuit.
R141.22	.....Parallel resonance of radio circuit.
R141.23	.....Time constant of radio circuit.
R141.3	.....Impulse excitation.
R141.4	.....Relaxation oscillations.
R141.5	.....Parasitic oscillations.
R142	.....Coupled circuits.
R142.1	.....Direct coupling.
R142.3	.....Inductive coupling.
R142.5	.....Capacitive coupling.
R143	.....Networks.
R143.1	.....Resistance-type attenuators.
R143.2	.....Filters.
R143.3	.....Equalizers.
R143.4	.....Time-delay networks.
R143.5	.....Pulse-forming networks.
R144	.....Radio-frequency resistance; contact resistance theory.
R144.1	.....Damping; decrement.
R144.2	.....Skin effect.
R145	.....Impedance; reactance.
R145.3	.....Inductive reactance.
R145.5	.....Capacitive reactance.

R146Harmonics; sub-harmonics.
 R146.1Harmonic amplification.
 R146.2Multivibrator.
 R146.3Harmonic radiation suppression.
 R147Beats.
 R148Modulation; modulated waves.
 R148.1Amplitude modulation.
 R148.11Modulation distortion.
 R148.12Modulation factor; percentage of modulation.
 R148.13Modulation side frequencies.
 R148.14Band width.
 R148.15Carrier suppression.
 R148.16Single side-band.
 R148.17Vestigial side-band.
 R148.18Intermodulation.
 R148.19Cross modulation.
 R148.2Frequency modulation.
 R148.3Phase modulation.
 R148.4Double modulation.
 R148.41Frequency conversion.
 R148.5Modulating methods.
 R148.51Grid modulation.
 R148.511Grid-current modulation.
 R148.512Grid-bias modulation.
 R148.513Low-level modulation.
 R148.514High-level modulation.
 R148.52Plate modulation.
 R148.521Heising or constant-current system of plate modulation.
 R148.522Modified constant-current system of plate modulation.
 R148.523Low-level modulation.
 R148.524High-level modulation.
 R148.6Pulse time modulation.
 R148.7Noise and hum effects.
 R149Rectification.
 R150Generating (transmitting) apparatus (except vacuum tubes).
 R152Spark transmitting apparatus.
 R153Arc transmitting apparatus.
 R154Alternator.
 R160Receiving apparatus, reception.
 R161Radio receiving sets.
 R161.1Selectivity of radio receiver.
 R161.2Sensitivity of radio receiver.
 R161.3Fidelity of radio receiver.
 R161.4Normal output of radio receiver.
 R161.5Interference output of radio receiver.
 R161.6Radio receiver noise.
 R161.7Distortion in radio receivers.
 R162Receiving-set circuit arrangements.
 R163Heterodyne reception.
 R164Superregenerative reception.
 R165Telephone receivers; loudspeakers.

R170Interference.
 R171Beat interference.
 R190Other radio principles.
 R191Principles of piezo-electricity applied to radio.
 R200 ..RADIO MEASUREMENTS AND STANDARDIZATION (Methods and use of
 apparatus for measurement, reports of measurements or tests).
 R201General methods and apparatus.
 R201.5Shielding and grounding.
 R201.7Use of cathode-ray oscillograph.
 R202Resonance methods.
 R203Harmonic methods.
 R204Null methods.
 R204.5Susceptance variation method.
 R205Substitution methods.
 R206Use of beat notes in measurements.
 R206.1Beat indicators.
 R207High-frequency bridge methods.
 R207.1Radio-frequency bridges.
 R207.2Audio-frequency bridges.
 R207.3Bridge balance indicators.
 R208Coaxial conductor methods.
 R209Resonant-cavity methods.
 R210Frequency, capacitance, dielectric constant, inductance.
 R211Frequency meters; circuit resonance method.
 R211.1Radio-frequency meter.
 R211.11Absorption-type frequency meter.
 R211.111Cavity frequency meter.
 R211.112Echo box.
 R211.12Generating-type frequency meter.
 R211.121Buzzer-driven type frequency meter.
 R211.122Heterodyne-type frequency meter.
 R211.123Dynatron-type frequency meter.
 R211.124Frequency monitor.
 R211.2Audio-frequency meter.
 R211.21Tuned-circuit frequency meter.
 R211.22Beat-frequency meter.
 R211.23Electronic frequency meter.
 R212Parallel-wire methods of frequency measurement.
 R213Harmonic methods of frequency measurement.
 R213.1Harmonic amplifiers; harmonic generators.
 R213.2Multivibrators; fractional-frequency generators;
 frequency dividers.
 R213.3Lissajou figures on cathode-ray oscillograph.
 R214Piezo-electric frequency standards.
 R214.1Piezo oscillators.
 R214.11Temperature-controlled cabinets.
 R214.2Piezo resonators.
 R214.21Equivalent electrical characteristics of piezo
 resonator.
 R214.22Mechanical overtone operation of piezo resonator.
 R215Capacitance.
 R215.1Capacitors (condensers).

R215.11	.....Air dielectric capacitors.
R215.111	..... Neutralizing capacitors.
R215.12	.....Mica dielectric capacitors.
R215.13	.....Paper dielectric capacitors.
R215.14	.....Gas dielectric capacitors.
R215.15	.....Ceramic dielectric capacitors.
R215.16	.....Vacuum-type capacitors.
R215.19	.....Capacitors with other types of dielectric.
R215.2	.....Distributed capacitance of coils.
R215.3	.....Q of capacitors.
R215.4	.....Capacitance meters; microfarad meters.
R216	.....Dielectric constant, specific inductive capacity, permittivity.
R216.1	.....Dielectric constant of solids.
R216.2	.....Dielectric constant of liquids.
R216.3	.....Dielectric constant of gases.
R217	.....Inductance.
R217.1	.....Self-inductance.
R217.11	.....Air-cored inductors.
R217.111	.....Radio-frequency choke coils.
R217.12	.....Iron-cored inductors.
R217.121	.....Audio-frequency choke coils.
R217.122	.....Powdered-iron cores.
R217.2	.....Mutual inductance.
R217.3	.....Q of coils.
R217.4	.....Coil comparators.
R221	.....Measurements on antennas.
R240	.....Resistance; current; voltage; impedance; power; phase; attenuation.
R241	.....Resistance; power factor.
R241.1	.....Resistance-variation method.
R241.2	.....Reactance-variation method.
R241.3	.....Substitution method.
R241.4	.....Calorimeter method.
R241.5	.....Bridge method.
R242	.....Current measurements.
R242.1	.....Ammeters.
R242.11	.....Hot-wire ammeter.
R242.12	.....Thermoelement.
R242.14	.....Electrodynamometer.
R242.15	.....String galvanometer.
R242.2	.....Current transformer.
R242.3	.....Eolometer bridge.
R243	.....Voltage measurements.
R243.1	.....Vacuum-tube voltmeters.
R243.2	.....Sparking distance.
R243.3	.....Electrostatic voltmeters.
R243.4	.....Thermoelement-type voltmeters.
R243.5	.....Copper-oxide rectifier-type voltmeters.
R243.6	.....Crystal-rectifier type voltmeters.
R243.7	.....Voltage divider.
R243.71	.....Resistor-type voltage divider.
R243.72	.....Capacitive-type voltage divider.

- R244 Impedance measurements.
- R244.1 Substitution method of impedance measurement.
- R244.11 Series-resonance method of impedance measurement.
- R244.12 Parallel-resonance method of impedance measurement.
- R244.2 Radio-frequency bridges.
- R244.3 Special instruments for impedance measurement.
- R244.4 Transmission lines in impedance measurement.
- R244.5 Concentric conductors in impedance measurement.
- R245 Power measurements.
- R245.1 I²R method of power measurement.
- R245.2 Bolometer method of power measurement.
- R245.3 Vacuum-tube wattmeters.
- R245.4 Incandescent-filament method of power measurement.
- R245.5 Thermistor method of power measurement.
- R245.6 Calorimeter method of power measurement.
- R246 Phase measurements.
- R246.1 Phase measurement by cathode-ray tube method.
- R246.2 Phase shifters.
- R246.21 Phase shift by circuit changes of resistance.
- R246.22 Phase shift by rotating magnetic field.
- R246.23 Phase shift by electrostatic method.
- R246.24 Phase shift by vacuum-tube method.
- R246.3 Phase monitor; phase-angle meter.
- R247 Attenuation measurements.
- R248 Ionosphere measurements.
- R248.1 Manual ionosphere measurements.
- R248.11 Fixed-frequency (h'f) ionosphere measurement.
- R248.12 Multifrequency (h'f) ionosphere measurement.
- R248.13 Pulse methods of ionosphere measurement.
- R248.14 Phase methods of ionosphere measurement.
- R248.2 Interpretation of ionosphere records.
- R250 Generating (transmitting) apparatus.
- R251 Transmitting sets.
- R251.1 Power rating of transmitting set.
- R252 Transmitting vacuum tubes (oscillator, amplifier).
- R252.1 Characteristic curves of transmitting tubes.
- R252.2 Grid-conductance of transmitting tubes.
- R252.3 Plate conductance, plate resistance of transmitting tubes.
- R252.4 Amplification factor of transmitting tubes.
- R252.5 Transconductance (mutual conductance) of transmitting tubes.
- R252.6 Internal capacitance of transmitting tubes.
- R252.7 Life tests of transmitting tubes.
- R252.8 Power output of transmitting tubes.
- R252.9 Other transmitter vacuum-tube measurements.
- R253 Transmitting capacitors.
- R254 Modulators.
- R254.1 Modulation measurements.
- R254.11 Measurement of amplitude modulation.
- R254.111 Amplitude modulation measurement by modulation meter.
- R254.112 Amplitude modulation measurement by cathode-ray oscillograph.
- R254.12 Measurement of frequency modulation.
- R254.13 Measurement of phase modulation.

R254.2Microphones.
R255Amplifiers.
R255.1Amplifier measurements.
R255.11Measurement of voltage amplification.
R255.12Measurement of amplitude distortion.
R255.13Measurement on amplifiers using square waves.
R255.2Distortion meter.
R255.3Intermediate amplifiers.
R255.4Speech amplifiers.
R255.5Power amplifiers.
R257Switching equipment.
R257.1Relays.
R257.11Time-delay relays.
R257.2Electronic switching.
R258Power-supply measurements.
R258.1Measurements on rectifiers.
R258.2Measurements on power-supply transformers.
R258.3Measurements on water-cooled power-supply systems.
R259Measurements on other types of generating equipment.
R260Receiving apparatus measurements.
R261Receiving set measurements.
R261.1Selectivity measurement.
R261.2Sensitivity measurement.
R261.3Fidelity measurement.
R261.4Normal output measurement.
R261.5Interference output measurement.
R261.51Hum and noise level measurement.
R261.52Cross-talk measurement.
R261.53Spurious response measurement.
R261.6Measurements on power supply for radio receiver.
R261.7Measurement of automatic volume-control characteristics.
R261.8Performance of individual units of receiver.
R261.9Alignment measurements.
R262Receiving vacuum-tube measurements.
R262.1Characteristic curves of receiving tubes.
R262.2Grid conductance of receiving tubes.
R262.3Plate conductance; plate resistance of receiving tubes.
R262.4Amplification factor of receiving tubes.
R262.5Transconductance (mutual conductance) of receiving tubes.
R262.6Internal capacitance of receiving tubes.
R262.7Life tests of receiving tubes.
R262.8Power output of receiving tubes.
R262.9Other receiving vacuum tube measurements.
R262.91Screen resistance of receiving tubes.
R262.92Screen mu factor of receiving tubes.
R262.93Distortion in receiving tubes.
R263Receiver amplifying apparatus; sound equipment.
R264Measurements on other component parts of radio receivers.
R264.1Capacitors for radio receivers.
R264.2Coils for radio receivers.
R264.3Transformers for radio receivers.
R264.4Resistors (fixed and variable) for radio receivers.

- R265Measurements on electroacoustic transducers.
- R265.1Telephone receiver measurements.
- R265.2Loudspeaker measurements.
- R270Measurement of radio field intensity, atmospheric radio noise,
man-made electrical noise.
- R271Radio field-intensity measurements.
- R271.1Standard antenna methods of field-intensity measurement.
- R271.11Calibrated loop-antenna method of field-intensity
measurement.
- R271.111Substitution method of field-intensity measurement.
- R271.12Standard dipole antenna method of field-intensity
measurement.
- R271.2Standard field generator method of field-intensity
measurement.
- R271.3Continuous recorder of radio field intensity.
- R271.31Potentiometer-type field-intensity recorder.
- R271.32Meter-type field-intensity recorder.
- R271.4Interpretation of field-intensity records.
- R272Atmospheric radio noise (See also R114).
- R272.1Atmospheric radio noise intensity measurement.
- R272.2Atmospheric radio noise direction measurement.
- R273Man-made electrical noise measurement.
- R273.1Radio noise meter.
- R280Properties of materials.
- R281Properties of electrical insulating materials.
- R281.1Insulation tester.
- R282Properties of electrical conducting materials.
- R282.1Properties of metallic conductors.
- R282.11Superconductivity.
- R282.2Properties of electrolytes.
- R282.21Properties of sea water.
- R282.22Properties of fresh water.
- R282.3Properties of magnetic materials.
- R282.4Properties of earth, soil.
- R282.9Properties of other electrical conducting materials.
- R283Effects of temperature on radio equipment.
- R283.1Test cabinets for use at varied temperatures, pressures
and humidities.
- R284Effects of high humidity on radio equipment.
- R284.1Fungus growth deterrents, tropicalization.
- R290Other radio measurements.
- R300RADIO APPARATUS AND EQUIPMENT (description, design, construction and
calculation on component parts).
- R310UHF equipment.
- R320Antenna systems.
- R320.3Antenna grounds.
- R320.4Antenna feeders.
- R320.41Transmission lines.
- R320.411Parallel wires.
- R320.412Coaxial lines.
- R320.5Antenna phasing equipment.
- R320.51Antenna coupling and phasing units.

R320.6Antenna switches.
R320.7Antenna markers.
R320.8Antenna towers.
R321Condenser-type antenna system (non-directional horizontally)
R321.1Low-frequency (long-wave) antennas.
R321.11Multiple-tuned antenna.
R321.2Single-wire antenna.
R321.21Grounded vertical-wire antenna.
R321.211Capacitance-top antenna.
R321.212Antenna with inductance top.
R321.22Ring-antenna system.
R321.3Half-wave antenna.
R321.31Doublet antenna.
R321.32Turnstile antenna.
R321.33Polyphase array.
R321.34Parasitic antenna.
R321.341Yagi array.
R321.4Flag-pole type antenna.
R321.5Tower-type antenna.
R325Directional antenna systems (transmitting in or receiving
from a particular horizontal direction).
R325.1Beam antennas.
R325.11Antenna arrays.
R325.111Rectangular array.
R325.112Broadside array.
R325.113End-fire array.
R325.113.1Fishbone antenna.
R325.114Two-element array.
R325.115Multiple array.
R325.2Wave antennas.
R325.21Beverage antenna.
R325.3Coil antennas.
R325.31Direction finder.
R325.311Null-type direction finder.
R325.312Electrically-switched type direction finder.
R325.32Combined coil and vertical antenna.
R325.4Adcock antenna.
R325.5Rhombic antenna.
R325.51Multiple-unit steerable antenna (Musa).
R325.6Resonant V-antenna, nonresonant V-antenna.
R325.7Antenna systems with reflectors.
R325.71Antenna with corner reflector.
R325.72Antenna with parabolic reflector.
R325.8Horn radiators.
R325.81Sectoral-type radiator.
R325.82Pyramidal-type radiator.
R325.83Conical-type radiator.
R325.84Biconical-type radiator.
R326Other antenna classifications.
R326.1All-wave antenna.
R326.2Mobile antenna systems.
R326.21Aircraft antenna.
R326.22Automobile antenna.

R326.23Ship antenna.
R326.24Tank antenna.
R326.25Multifrequency tuned antenna.
R326.3Long-wave antennas.
R326.4Broadcast antennas.
R326.5Short-wave antennas.
R326.6Television antennas.
R326.61Wide-band antenna.
R326.611Cylindrical antenna.
R326.612Conical antenna.
R326.613Spheroidal antenna.
R326.614Diamond antenna.
R326.615Double-diamond antenna.
R326.7Ultra-high-frequency antennas.
R326.8Microwave antennas.
R326.81Wave-guide antennas.
R327Artificial antennas.
R329Other types of antennas.
R330Vacuum tubes (transmitting, receiving, special-purpose types).
R331Construction; evacuation of vacuum tubes.
R331.5Operation of vacuum tubes.
R332Detector tubes.
R333Voltage amplifier tubes.
R334Power amplifier tubes.
R335Converter and mixer tubes.
R336Oscillator tubes.
R337Rectifier tubes.
R337.1Gas tubes.
R337.11Hot-cathode gaseous rectifier tubes.
R337.12Grid-controlled gaseous rectifier tubes (thyratrons).
R338Regulator tubes.
R338.1Current regulator tubes.
R338.2Voltage regulator tubes.
R339Special-purpose tubes.
R339.1Cold-cathode tubes.
R339.11Cold-cathode diodes.
R339.12Cold-cathode triodes.
R339.2Ultra-high-frequency tubes.
R350Generating apparatus; transmitters.
R351Pulse transmitters.
R352Spark transmitters.
R353Arc transmitters.
R354Radio-frequency alternators.
R355Vacuum-tube transmitters.
R355.11Very low-frequency transmitter (below 30 kc).
R355.12Low-frequency transmitter (30 to 300 kc).
R355.13Medium-frequency transmitter (300 to 3000 kc).
R355.131Broadcast-frequency transmitter (550 to 1600 kc).
R355.14High-frequency transmitter (3000 to 30,000 kc).
R355.15Very high-frequency transmitter (30 to 300 Mc).
R355.16Ultra-high-frequency transmitter (300 to 3000 Mc).
R355.17Super-high-frequency transmitter (3000 to 30,000 Mc and above).

R355.6Frequency control of transmitters.
R355.65Piezo oscillators.
R355.66Magnetostriction oscillators.
R355.7Transmitter power amplifiers.
R355.8Transmitter modulators.
R355.81Amplitude-type modulator.
R355.811Absorption-type modulator.
R355.812Grid modulator.
R355.813Plate modulator.
R355.814Balanced modulator.
R355.815Bridge modulator.
R355.815.1Copper-oxide rectifier-type modulator.
R355.815.2Double-balanced or ring modulator.
R355.82Phase-type modulator.
R355.83Frequency-type modulator.
R355.9Generating sets for special purposes; (musical instruments R593; therapeutic uses R594).
R355.91Vacuum-tube oscillators.
R355.911Radio-frequency oscillators.
R355.911.1Feed-back oscillator.
R355.911.11Hartley oscillator.
R355.911.12Meissner oscillator.
R355.911.13Colpitts oscillator.
R355.911.14Tuned-grid oscillator.
R355.911.15Tuned-plate oscillator.
R355.911.16Tuned-grid - tuned-plate oscillator.
R355.911.17Electron-coupled oscillator.
R355.911.18Magnetostriction oscillator.
R355.911.2Negative-resistance oscillator.
R355.911.21Dynatron oscillator.
R355.911.22Transitron oscillator.
R355.911.23Negative-resistance push-pull oscillator.
R355.911.24Negative grid-resistance oscillator.
R355.911.3Beat-frequency oscillator.
R355.911.4Constant-frequency oscillator.
R355.911.41Piezo oscillator.
R355.911.411Bridge-stabilized oscillator.
R355.911.42Magnetostriction oscillator.
R355.911.5Polyphase oscillator.
R355.912Ultra-high-frequency oscillators.
R355.912.1Magnetron oscillator.
R355.912.11Electronic-type magnetron.
R355.912.12Negative-resistance type magnetron.
R355.912.2Barkhausen-Kurtz oscillator.
R355.912.3Klystron oscillator (velocity modulation).
R355.912.4Heil tube oscillator.
R355.912.5Inductive-output tube oscillator.
R355.913Laboratory oscillators.
R355.913.1Standard frequency oscillator.
R355.913.2Standard voltage generator.
R355.913.3Standard pulse generator.
R355.913.4Square-wave generator.
R355.913.5Time-base generator.

R355.914Audio-frequency oscillators.
 R355.914.1Feed-back oscillator.
 R355.914.2Beat-frequency oscillator.
 R355.914.3Resistor-capacitor type oscillator.
 R355.914.31Phase-shift type oscillator.
 R355.914.4Relaxation oscillators.
 R355.914.41Multivibrators.
 R355.914.42Van der Pol oscillator.
 R355.914.43Gas-filled tube oscillator.
 R355.914.431Sweep-circuit oscillator.
 R355.914.432Saw-tooth generator.
 R355.914.433Time-interval generator.
 R355.914.5Tuning-fork stabilized oscillator.
 R355.914.6Code-training oscillator.
 R356Transmitter power supply.
 R356.1Direct-current supply.
 R356.11D-c power line.
 R356.12Batteries.
 R356.13Vibrator-system power supply.
 R356.14Generators.
 R356.141Dynamotors.
 R356.2Alternating-current power supply.
 R356.21A-c power line.
 R356.22A-c generator.
 R356.23Rectified a-c power supply.
 R356.231Rectifier filters.
 R357Frequency changers, multipliers, dividers, mixers.
 R357.1Harmonic amplifiers, harmonic generators.
 R357.2Frequency multipliers.
 R357.21Multivibrators.
 R357.22Doublers; triplers.
 R357.3Frequency dividers.
 R357.31Multivibrators.
 R357.32Demodulating dividers.
 R357.33Fractional-frequency generators.
 R357.4Frequency mixers.
 R358Protective devices.
 R358.1Lightning arrestors.
 R358.4High-voltage interlocks.
 R358.5Fuses.
 R359Automatic transmitters.
 R359.1SOS transmitters.
 R359.2Telegraph transmitters.
 R359.3Teletype transmitters.
 R359.4Fire-alarm transmitters.
 R359.5High-water alarm transmitters.
 R360Radio receiving apparatus.
 R361Receiving sets.
 R361.1Receiving set types.
 R361.101Tuned r-f receiver.
 R361.102Superheterodyne receiver.
 R361.102.1Radio-frequency section.

R361.102.2	.....	Converter-oscillator section.
R361.102.3	.....	Intermediate-frequency section.
R361.102.4	.....	Detector section.
R361.102.5	.....	Audio-frequency section.
R361.103	.....	Regenerative receiver.
R361.104	.....	Superregenerative receiver.
R361.104.1	.....	Separate quenching receiver.
R361.104.2	.....	Self-quenching receiver.
R361.105	.....	Single-signal receiver.
R361.106	.....	Single side-band receiver.
R361.107	.....	Diversity receiver.
R361.107.1	.....	Frequency diversity receiver.
R361.107.2	.....	Space diversity receiver.
R361.107.3	.....	Polarization diversity receiver.
R361.108	.....	Musa receiver.
R361.109	.....	Tone-corrected (stenode) receiver.
R361.110	.....	Triple detection receiver.
R361.111	.....	Frequency modulation receiver.
R361.112	.....	Transmission-line tuned receiver.
R361.113	.....	Very high-frequency (30 to 300 Mc) receiver.
R361.114	.....	Ultra-high-frequency (300-3000 Mc) receiver.
R361.115	.....	Super-high-frequency (3000-30,000 Mc) receiver.
R361.116	.....	Broadcast receiver.
R361.117	.....	Communications receiver.
R361.118	.....	Automobile receiver.
R361.119	.....	Airways receiver.
R361.120	.....	Transceivers.
R361.121	.....	Panoramic receiver.
R361.122	.....	Phase-modulation receiver.
R361.123	.....	Pulse receiver.
R361.2	.....	Radio receiving-set features.
R361.201	.....	Automatic volume control (AVC).
R361.201.1	.....	Muting system, quieting or squelch, tuning silencers, interchannel noise suppressors, codans.
R361.202	.....	Manual volume control.
R361.203	.....	Tone control.
R361.204	.....	High fidelity reproduction.
R361.205	.....	Push-button tuning.
R361.206	.....	Frequency-range change.
R361.207	.....	Frequency band-spread.
R361.208	.....	Spurious response.
R361.209	.....	Crystal-controlled receivers.
R361.210	.....	Cross-talk, cross-modulation.
R361.211	.....	Noise, signal-to-noise ratio.
R361.212	.....	Microphonics.
R361.213	.....	Tracking and alignment of tuned circuits.
R361.214	.....	Tuning indicator.
R361.215	.....	Automatic frequency control for receivers.
R362	.....	Detectors.

R362.1Crystal detector.
R362.2Vacuum-tube detector.
R362.21Diode detector.
R362.22Grid-leak power detector.
R362.23Square-law (weak-signal) detector.
R362.3Magnetic detector.
R362.4Electrolytic detector.
R362.9Other types of detectors.
R363Amplifiers (for power and receiving applications).
R363.1Radio-frequency amplifiers.
R363.11Tuned-voltage amplifier.
R363.12Band-pass amplifier.
R363.13Intermediate-frequency (I.F.) amplifier.
R363.14Class B amplifier.
R363.141Linear amplifier.
R363.15Class C amplifier.
R363.16Velocity modulation amplifier.
R363.2Audio-frequency amplifiers.
R363.21A-F voltage amplifier.
R363.211Resistance-coupled amplifier.
R363.212Transformer-coupled amplifier.
R363.212.1Shunt-feed amplifier.
R363.213Impedance-coupled amplifier.
R363.22A-F power amplifier.
R363.221Class A amplifier.
R363.222Push-pull amplifier.
R363.222.1Class AB amplifier.
R363.222.2Class B amplifier.
R363.23Feed-back amplifier.
R363.3Direct-current amplifier.
R363.4Video amplifier (wide-band).
R363.41Video voltage amplifier.
R363.42Video power amplifier.
R365Electroacoustic transducers.
R365.1Telephone receivers.
R365.2Loudspeakers.
R365.21Permanent-magnet type speaker.
R365.22Dynamic speaker.
R365.23Magnetic-armature type speaker.
R365.24Condenser-type speaker.
R365.25Piezoelectric-type speaker.
R365.29Other types of loud speakers.
R365.3Recorders.
R365.31Time-signal recorder.
R365.32Signal-intensity recorder.
R365.33Ionosphere recorders.
R365.331Manual ionosphere recorder.
R365.332Fixed-frequency (h't) recorder.
R365.333Multifrequency (h'f) recorder.
R365.334Absorption recorder.
R365.335Scatter recorder.
R365.34Radio-frequency recorder.

R365.35	.....Magnetic recorder.
R365.36	.....Meteorological recorder.
R365.37	.....Wave direction recorder.
R366	.....Radio receiver power supply.
R366.1	.....Direct-current power supply.
R366.11	.....Power-line supply.
R366.12	.....Batteries.
R366.13	.....Vibrators.
R366.14	.....Generators.
R366.15	.....Regulated d-c voltage supply.
R366.151	.....Electronic voltage regulator.
R366.152	.....Neon-tube regulator.
R366.153	.....Ballast-resistance regulator.
R366.2	.....Alternating-current power supply.
R366.21	.....25-60 cycle power line.
R366.22	.....Rotary dc to ac.
R366.23	.....A-c voltage regulator.
R366.231	.....Magnetic saturation regulator.
R366.3	.....Rectifiers.
R366.31	.....Rotary ac to dc rectifier.
R366.32	.....Vacuum-tube rectifier.
R366.33	.....Vibrator-type rectifier.
R366.34	.....Copper-oxide rectifier.
R366.35	.....Selenium rectifier.
R366.36	.....Magnesium-copper sulphide rectifier.
R366.37	.....Rectifier filters.
R367	.....Remote control of radio receiving equipment.
R370	....Instruments.
R371.1	.....Wave analyzer.
R371.11	.....Heterodyne-type wave analyzer.
R371.2	.....Spectrum analyzer.
R371.3	.....Time-interval meter.
R371.4	.....Q-meter.
R371.5	.....Cathode-ray oscillograph; oscilloscope.
R371.51	.....Electronic switch.
R371.6	.....Range calibrator.
R371.7	.....Standing-wave indicator.
R372	.....Electrical indicating instruments.
R372.1	.....Ohmmeter, volt-ohmmeter.
R374	.....Frequency meters.
R374.1	.....Radio-frequency meter.
R374.11	.....Absorption-type frequency meter.
R374.111	.....Cavity frequency meter.
R374.112	.....Echo box.
R374.12	.....Generating-type frequency meter.
R374.121	.....Buzzer-driven frequency meter.
R374.122	.....Heterodyne-type frequency meter.
R374.123	.....Dynatron-type frequency meter.
R374.124	.....Frequency monitor.
R374.2	.....Audio-frequency meter.
R374.21	.....Tuned-circuit frequency meter.
R374.22	.....Beat-frequency meter.
R374.23	.....Electronic-type a-f meter.

R374.5Decrameter.
R380Component parts.
R381Capacitors.
R381.1Fixed capacitors.
R381.11Mica capacitors.
R381.12Ceramic capacitors.
R381.13Air capacitors.
R381.14Electrolytic capacitors.
R381.15Paper capacitors.
R381.16Vacuum capacitors.
R381.2Variable capacitors.
R381.21Variable air capacitors.
R381.22Padder capacitors.
R382Inductors.
R382.1Transformers for communications equipment.
R382.11Radio-frequency transformers.
R382.12Audio-frequency transformers.
R383Resistors.
R383.1Fixed resistors.
R383.11Wire-wound resistors.
R383.12Composition resistors.
R383.121Carbon resistors.
R383.122Metallized resistors.
R383.2Variable resistors.
R383.21Attenuator network.
R383.22Impedance-matching network.
R383.23Decade resistance box.
R385Modulation and keying devices.
R385.1Keys.
R385.2Buzzers.
R385.3Interruptors (tone wheels, choppers).
R385.4Vacuum-tube modulation devices.
R385.5Microphones.
R385.51Carbon microphone.
R385.52Dynamic or moving-coil type microphone.
R385.53Condenser microphone.
R385.54Unidirectional ribbon microphone.
R385.55Velocity-type ribbon microphone.
R385.56Piezoelectric (crystal) microphone.
R385.59Other speech equipment.
R386Filters.
R386.1Band-pass filter.
R386.2Low-pass filter.
R386.21Scratch-eliminator filter.
R386.3High-pass filter.
R386.4Band-eliminator filter.
R386.41Power-line noise-eliminator filter.
R386.5Piezoelectric (crystal) filter.
R386.6Power-pack-type filter.
R387Protective equipment.
R387.1Shields.
R387.5Grounds.
R387.7Insulators.

R389Other components.
R389.1Relays.
R389.11Plug-in relay.
R389.12Small-switching relay.
R389.13Small-telephone-type relay.
R389.14Stepping relay.
R389.15Time-delay relay.
R389.16Transmitter-switching and keying relay.
R389.17Vacuum relay.
R389.18Overload relay.
R390Other radio apparatus and equipment (public-address systems)
R391Public-address systems.
R391.1Phonographic recorder.
R391.11Transcription turn tables.
R392Volume indicators.
R396Attenuators.
R396.1Resistance-type attenuator.
R396.2Mutual inductance type attenuator.
R396.3Mutual capacitance type attenuator.
R396.9Miscellaneous types of attenuators.
R400 ..RADIO COMMUNICATION SYSTEMS (Complete communication systems,
or parts of a system which are considered in relation to
the complete system).
R410Damped-wave (transmitting) systems.
R411Spark communication system.
R412Timed-spark communication system.
R413Impulse-excitation communication system.
R420Continuous-wave (transmitting) systems.
R421High-frequency alternator.
R421.1Alexanderson alternator.
R421.2Goldschmidt alternator.
R421.3Static-frequency multiplier.
R422Arc communication system.
R423Vacuum-tube systems (transmitting).
R423.11Very low-frequency system (below 30 kc).
R423.12Low-frequency system (30 to 300 kc).
R423.13Medium-frequency system (300 to 3000 kc).
R423.131Broadcast-frequency system (550 to 1600 kc).
R423.132Synchronization of broadcast stations.
R423.14High-frequency system (3000 to 30,000 kc).
R423.15Very high-frequency system (30 to 300 Mc).
R423.16Ultra-high-frequency system (300 to 3000 Mc).
R423.17Super-high-frequency system (3000 to 30,000 Mc and higher).
R423.2Telegraph code transmitters.
R423.21Frequency diversity transmitter.
R423.22Space diversity transmitter.
R423.23Polarization diversity transmitter.
R423.3Variable-carrier transmitter.
R423.4Suppressed-carrier transmitter.
R423.5Single side-band (asymmetric or vestigial side-band)
transmitter.
R423.51Single side-band by filter system.
R423.52Single side-band by phase-shift system.

- R423.6Single side-band plus carrier transmitter.
- R423.7Amplitude-modulation transmitter.
- R423.8Frequency-modulation transmitter.
- R423.81Armstrong system of FM.
- R423.82Automatic frequency-control system of FM.
- R423.83Morrison system of FM.
- R423.9Secrecy equipment.
- R426Beat reception.
- R427Use of receiving interruptors and tone wheels.
- R428Diversity receiving systems.
- R429Other continuous-wave systems.
- R430Interference elimination.
- R430.1Radio interference.
- R430.11Station interference.
- R430.2Man-made electrical interference.
- R430.21Power-line interference.
- R430.22Household-appliance interference.
- R430.23Therapeutic-appliance interference.
- R430.231Diathermy interference.
- R430.232Electrosurgical-appliance interference.
- R430.232.1Spark electrosurgical-appliance interference.
- R430.232.2Vacuum-tube electrosurgical-appliance interference.
- R430.24Automobile-ignition interference (see also R521.2 aircraft
ignition shielding).
- R430.25Industrial-heating equipment interference.
- R440Remote control (by wire).
- R450Connection of radio systems to wire systems (vodas).
- R460Duplex and multiplex systems.
- R470Radio-frequency carrier wire systems.
- R480Radio relay systems.
- R490Other systems.
- R500APPLICATIONS OF RADIO (Radio as an instrument in other arts,
fields, industries, etc.).
- R510Marine applications of radio.
- R511Marine distress signals.
- R512Radio marine navigation aid systems.
- R512.1Marine position finding.
- R512.11Marine radio beacons.
- R512.12Marine fog signalling.
- R512.13Marine radio compass (direction finding).
- R512.14Marine distance finding.
- R512.2Long-range navigation system, Loran.
- R512.3Marine collision prevention.
- R513Fishing boats.
- R514Tow-boat devices.
- R515Submarine signalling.
- R516Marine life-saving service.
- R517Lighthouse service.
- R520Aeronautic applications of radio.
- R521Receiving on aircraft.
- R521.1Receiving sets for aircraft.
- R521.2Ignition shielding on aircraft.
- R521.3Static suppressors for aircraft.
- R522Transmitting from aircraft.

R522.1Transmitters for aircraft.
R522.2Bonding of aircraft.
R523Receiving from aircraft.
R524Transmitting to aircraft.
R525Airplane antennas (See also R326.21).
R526Radio as navigation aid to aircraft.
R526.1Beacon systems for aircraft.
R526.11Equi-signal beacon system (radio range).
R526.111Coded beacon system.
R526.112Audio-modulated beacon system.
R526.113Simultaneous-phone beacon system.
R526.114Course-identification beacon system.
R526.12Omni-directional beacon system.
R526.13Non-directional beacon system (for direction finding).
R526.14Timed-rotating beacon system.
R526.15Beacon-system markers.
R526.151Beacon-system route marker.
R526.152Beacon-system obstruction marker.
R526.153Beacon-system fan marker.
R526.154Beacon-system cone of silence marker.
R526.2Instrument landing of aircraft.
R526.21Instrument-landing beam
R526.22Instrument-landing marker
R526.23Instrument-landing runway-localizer.
R526.3Direction finders for aircraft.
R526.4Collision-prevention devices for aircraft.
R526.5Radio altimeters for aircraft.
R527Automatic control of aircraft.
R530Commercial and miscellaneous radio services.
R531Traffic.
R531.1Code and ciphers.
R531.2Station call letters.
R531.3Abbreviations.
R531.4Alphabets, Morse and Continental (international) code.
R531.5Traffic relations with land lines.
R531.6Traffic relations with cables.
R531.7Message rates.
R531.8Operating data for radio propagation analysis
R531.81Traffic logs.
R531.82Frequency usage on traffic circuits.
R531.83Figures of merit on traffic circuits.
R531.84Predictions of frequency usage for traffic circuits.
R531.85Comparison of frequency usage with ionosphere conditions.
R532Press services.
R533Railroad communications.
R534Radio applications in agriculture.
R535Radio applications in forestry.
R536Radio applications in mining and geophysical prospecting.
R537Radar
R537.1Radar sets.
R537.11Radar antenna and scanning mechanism.
R537.12Radar transmitter.

R537.121Radar r-f oscillator.
R537.122Radar modulator.
R537.13Radar receiver.
R537.131Radar indicator.
R537.2Radar beacons.
R537.3Radar power.
R537.4Radar tests.
R537.9Radar countermeasures.
R538Police radio.
R538.1Radio applications in Department of Justice.
R538.2Radio applications in prisons.
R538.3State and county police radio.
R538.4City and metropolitan police radio.
R539Miscellaneous radio services.
R539.1Data exchange by radio.
R539.11Synoptic code systems for data exchange.
R539.12Cipher systems for data exchange.
R540Utilities, special services.
R541Use of radio by public utilities.
R542General mobile radio, taxicab radio.
R543Fire-service radio.
R544Citizens radio communications (walkie-talkie).
R545Amateur radio.
R546Rural radio telephone.
R547Use of radio in special emergency services.
R547.1Doctor's radio call service.
R549Other special services.
R550Broadcasting.
R551Time signals.
R551.1Longitudinal determinations.
R553Meteorological radio signals.
R553.1Radio meteorographs (radiosondes).
R553.2Reemitters.
R555Standard frequency signals.
R557Education by radio.
R560Military radio.
R561Army radio.
R565Navy radio.
R568Coast Guard radio.
R570Remote control by radio.
R570.1Remote control of aircraft.
R570.2Remote control of marine craft.
R570.3Remote control of land craft.
R570.4Remote control of missiles (See also R560).
R570.5Remote control by radio at a fixed point.
R580Picture transmission (television); teletype.
R581Facsimile (including photographs).
R582Motion pictures.
R583Television.
R583.1Basic theory of television.
R583.11Television image analysis.
R583.12Television camera action.
R583.13Scanning beam formation, deflection and synchronization.

R583.14	.....Video signal amplification and transmission.
R583.15	.....Television image reproduction.
R583.16	.....Television propagation and coverage.
R583.17	.....Television progress and plans.
R583.2	.....Television studio technique.
R583.3	.....Television studio equipment
R583.4	.....Television transmitters.
R583.5	.....Television receivers.
R583.6	.....Television tubes.
R584	.....Teletype.
R590	....Other applications of radio.
R591	.....Transmission of power by radio.
R593	.....Musical instruments.
R594	.....Therapeutics.
R594.1	.....Diathermy.
R594.11	.....Condenser field application of diathermy.
R594.12	.....Induction field application of diathermy.
R594.2	.....Electrosurgery.
R594.21	.....Surgeon's metal locator.
R594.3	.....Electrocardiography.
R594.4	.....Hearing aids.
R596	.....Use of radio in engineering construction.
R596.1	.....Use of radio in surveying.
R597	.....Burglar alarms.
R598	.....Industrial heating by r-f currents.
R600	..RADIO STATIONS: EQUIPMENT, REGULATIONS, DESIGN, OPERATION, MANAGEMENT, AND MAINTENANCE.
R610	....Radio station equipment.
R611	.....Very low-frequency station (below 30 kc).
R612	.....Low-frequency station (30-300 kc).
R613	.....Medium-frequency station (300-3000 kc).
R613.1	.....Broadcast frequency station (550-1600 kc).
R613.11	.....Radio broadcast studios.
R613.111	.....Studio acoustics.
R614	.....High-frequency station (3000 to 30,000 kc).
R615	.....Very high-frequency station (30-300 Mc).
R616	.....Ultra-high frequency station (300 to 3000 Mc).
R617	.....Super-high-frequency station (3000 to 30,000 Mc and higher).
R618	.....Ship radio stations.
R619	.....Direction-finding stations.
R620	....Radio station regulations, design, operation, maintenance and management.
R621	.....Regulations for radio stations.
R621.1	.....Radio station construction applications and permits.
R621.2	.....Radio station licenses.
R621.21	.....Radio station operator's licenses.
R622	.....Radio station design and planning.
R622.1	.....Radio station site selection.
R623	.....Radio station operation.
R624	.....Radio station maintenance.
R625	.....Radio station management.
R630	....Frequency modulation broadcasting (FM).
R630.1	.....Theory of frequency modulation.

R630.11	.....Frequency modulation propagation and coverage.
R630.12	.....Frequency modulation progress and plans.
R630.2	.....Frequency modulation stations.
R630.21	.....Frequency modulation transmitters.
R630.22	.....Frequency modulation studio equipment.
R630.23	.....Frequency modulation studio-transmitter links.
R630.24	.....Frequency modulation networks.
R630.25	.....Frequency modulation receivers.
R700	..RADIO MANUFACTURING AND REPAIRING.
R710	....Factories.
R720	....Processes, methods.
R730	....Radio servicing and repairing.
R740	....Sales, merchandizing.
(R800)*	..NON-RADIO SUBJECTS (material of interest, but not a part of radio).
347.7	.....Patent service.
353.821*	.....National Bureau of Standards.
383	.....Postal service, air mail service (See also Aeronautics 629.13).
507.2	.....General Science.
510	....Mathematics.
520	....Astronomy.
523.74	.....Sun spots.
523.78	.....Eclipses of the sun.
525	.....Earth.
526	.....Geodesy.
526.8	.....Map projections.
529.78	.....Instruments for measuring time (watches, clocks).
530	....Physics.
531	.....Mechanics.
532	.....Liquids, hydrostatics.
533	.....Gases, pneumatics.
533.85	.....Vacuum apparatus.
534	.....Sound.
534.3	.....Tuning forks.
534.83	.....Signals in navigation.
535	.....Light (Light signaling see 623.731).
535.3	.....Photo-electric phenomena.
535.38*	.....Photo-electric tubes; cells and applications; Kerr cell; selenium cell.
536	.....Heat.
536.33	.....Radiation; general theory.
536.83	.....Heating by induction.
537	.....Electricity.
537.1	.....Theory of electricity, A.C. theory.
537.23	.....Electrostatic generators.
537.26*	.....Corona discharge.
537.4	.....Lightning.
537.6	.....Electrodynamics.
537.65*	.....Piezoelectric phenomena. (See also R191, R214, R355.65, and R355.911.41).

The numbers marked with an asterisk () are not found in the Dewey decimal classification, but are inserted here for convenience.

- 537.67^aExperimental plotting of electrical fields.
- 537.7Wave form analysis.
- 537.87Physiological electrical phenomena.
- 538Magnetism.
- 538.11^aMagnetostriktion.
- 539Molecular physics; atomic physics.
- 539.7Radioactivity.
- 540Chemistry.
- 541.3Physical chemistry.
- 550Geology.
- 551.5Weather; meteorology.
- 621Mechanical engineering.
- 621.3Electrical engineering.
- 621.313Electric generators; electric motors.
- 621.313.2Direct-current machinery.
- 621.313.23Direct-current generators.
- 621.313.24Direct-current motors.
- 621.313.25Motor generators.
- 621.313.26Dynamotors.
- 621.313.3Alternating-current machinery.
- 621.313.43Alternating-current generators.
- 621.313.44Synchronous motors.
- 621.313.63Induction motors.
- 621.313.66Repulsion motors.
- 621.313.66Phase converter or adaptor.
- 621.313.7Rectifiers.
- 621.314.3Transformers.
- 621.314.5Voltage regulators.
- 621.314.51^aVoltage control equipment.
- 621.314.6Choke coils.
- 621.314.7Induction coils.
- 621.317Switchboards.
- 621.317.3Switches.
- 621.317.4Rheostats.
- 621.319.2Transmission lines.
- 621.325Incandescent arcs.
- 621.326Incandescent filament lamps.
- 621.327.4Mercury vapor tubes (lamps).
- 621.327.7X-ray tubes.
- 621.353Batteries, primary.
- 621.354Batteries, secondary (storage).
- 621.354.7Battery-charging devices.
- 621.37Electrical measurements, meters and testing.
- 621.371General.
- 621.372Standards, Calibration of instruments.
- 621.373Meters. General types.
- 621.374Special meters and measurements.
- 621.374.2Wheatstone bridges, ohmmeters, resistance boxes,
inductance, capacitance.
- 621.374.3Voltmeters, electrometers, standard cells,
volt-ohmmeters.
- 621.374.4Current, galvanometers, ammeters, coulometers,
ampere-hour meters.

621.374.5	.....	Watt-hour meters.
621.374.6	.....	Wattmeters.
621.374.7	.....	Frequency meters. Oscillographs.
621.374.9	.....	Other meters and measurements.
621.374.91	.....	Phase meters. Power-factor meters.
		Synchronizers.
621.375*	.....	Vacuum tubes, special applications other than radio.
621.375.1	.....	Control of conditions.
621.375.101	.....	Electric load.
621.375.102	.....	Humidity, moisture content.
621.375.103	.....	Illumination.
621.375.104	.....	Motion.
621.375.105	.....	Pressure.
621.375.106	.....	Switching.
621.375.107	.....	Synchronization.
621.375.108	.....	Temperature.
621.375.109	.....	Traffic.
621.375.13	.....	Control of devices.
621.375.131	.....	Doors.
621.375.132	.....	Elevator levelling.
621.375.133	.....	Motors.
621.375.15	.....	Control of processes.
621.375.151	.....	Chemical.
621.375.152	.....	Combustion.
621.375.153	.....	Electroplating.
621.375.154	.....	Welding.
621.375.2	.....	Counting process.
621.375.3	.....	Grading, sorting process.
621.375.4	.....	Heating control.
621.375.41	.....	Food sterilization, dehydration.
621.375.42	.....	Gluing.
621.375.43	.....	Metal hardening, tempering.
621.375.44	.....	Plastics industry.
621.375.45	.....	Wood drying.
621.375.5	.....	Ignition systems.
621.375.6	.....	Measurements, tests.
621.375.601	.....	Color.
621.375.602	.....	Conductivity of solutions.
621.375.603	.....	Density, opacity.
621.375.604	.....	Electron microscope.
621.375.605	.....	Gas detection and analysis.
621.375.606	.....	Hardness.
621.375.607	.....	Light intensity.
621.375.608	.....	Metallurgy, cyclograph.
621.375.609	.....	Miscellaneous chemical tests.
621.375.610	.....	pH determination.
621.375.611	.....	Photography (high-speed).
621.375.612	.....	Reflection.
621.375.613	.....	Smoke detection, recording.
621.375.614	.....	Speed, velocity.
621.375.615	.....	Strain.
621.375.616	.....	Telemetering.

- 621.375.617Thickness.
- 621.375.618Time.
- 621.375.619Titration.
- 621.375.620Turbidity.
- 621.375.621Vacuum and ionization gages.
- 621.375.622Vibration.
- 621.375.623X-rays.
- 621.375.624Fluxmeter, magnetic field measurement.
- 621.375.7Weighing.
- 621.379Other electrical measuring instruments.
- 621.38Electric communication.
- 621.382Telegraphy.
- 621.382.4High-speed telegraphy.
- 621.382.5Printing telegraph.
- 621.382.7Picture transmission, facsimile (by wire)
(See also R581).
- 621.382.8Submarine cable.
- 621.382.92*Ground telegraphy.
- 621.382.94Induction signaling.
- 621.383.21Relays.
- 621.385Telephony.
- 621.385.91*Program distribution.
- 621.385.95*Condenser transmitters.
- 621.385.97*Electroacoustic devices; telephone units
(See also R594.4).
- 621.385.971*Electric phonograph.
- 621.388Television (by wire).
- 621.39Other applications of electricity.
- 622.12Prospecting, electrical methods.
- 623.731Light signals.
- 623.823Steamships.
- 629.13Aeronautics.
- 629.132.5Aerial navigation.
- 629.134Airplane construction.
- 629.136Airports, airdromes, seadromes.
- 658Business methods.
- 681.114.4Chronometers.
- 681.116Electric clocks.
- 681.134Moving picture apparatus.
- 681.134.96*Sound motion pictures.
- 681.135Sound producers.
- 681.843Sound recording.
- R900MISCELLANEOUS RADIO (Material which has no specific place.
See also R000).

V. Subject Index

Abacs R082
Abbreviations, radio traffic R531.3
Absorption, atmospheric vs. field intensity R113.22
Absorption fading of radio waves R113.103
Absorption of ground wave in atmosphere R112.16
Absorption, ionospheric R113.22
Absorption recorder for ionosphere R365.334
Absorption type frequency meter R211.11, R374.11
A-c generator, transmitter power supply R356.22
A-c power line, transmitter supply R356.21
A-c theory 537.1
Accessories, radio R078
Acoustics, broadcast studios R613.111
Action of television camera R583.12
Adcock antennas R125.4, R325.4
Administrative, radio R005
Aerial navigation 629.132.5
Aeronautics 629.13
Aeronautic applications of radio R520
Agriculture, radio applications R534
Air-cored inductors, measurement R217.11
Aircraft antenna R326.21, R525
Aircraft, automatic control of R527
Aircraft beacon coded systems R526.111
Aircraft beacon system R526.1
Aircraft, beacon system fan markers R526.153
Aircraft, beacon system obstruction markers R526.152
Aircraft bonding R522.2
Aircraft, collision prevention devices R526.4
Aircraft direction finders R526.3
Aircraft, equi-signal beacon system for R526.11
Aircraft, ignition shielding on R521.2
Aircraft instrument landing markers R526.22
Aircraft landing by instrument R526.2
Aircraft, navigation aid, by radio R526
Aircraft, non-directional beacon systems R526.13
Aircraft, omnidirectional beacon system R526.12
Aircraft, radio altimeters R526.5
Aircraft, radio beacon systems R526.1
Aircraft, radio range system R526.11
Aircraft, receiving from R523
Aircraft, receiving on R521
Aircraft, receiving sets on R521.1
Aircraft, remote control of R570.1
Aircraft, simultaneous phase beacon systems R526.113
Aircraft static suppressor R521.3
Aircraft, timed-rotating beacon systems R526.14
Aircraft, transmitter for R522.1
Aircraft, transmitting from R522
Aircraft, transmitting to R524

Air dielectric capacitors, measurement R215.11
Airdrome, construction of 629.136
Air mail service 383
Airplane construction 629.134
Airports, construction of 629.136
Airways receiver R361.119
Alignment measurements of receivers R261.9
Alignment of tuned circuits, receivers R361.213
All-wave antenna R326.1
Alphabets, radio code R531.4
Alternating-current generators 621.313.43
Alternating-current machinery 621.313.3
Alternating-current power supply for transmitters R356.2
Alternators R154
Alternator, Goldschmidt R421.2
Alternator, Alexanderson R421.1
Alternator, high-frequency R421
Alternator, radio-frequency R354
Altimeter, radio, for aircraft R526.5
Amateur services R545
Ampere-hour meter 621.374.4
Amplification factor, measurement, receiving tubes R262.4
Amplification factor measurement, transmitting tubes R252.4
Amplification, harmonic R146.1
Amplification of video signal R583.14
Amplification voltage measurement R255.11
Amplifiers, a-f, class A R363.221
Amplifiers, a-f, class B R363.222.2
Amplifiers, a-f, power R363.22
Amplifiers, a-f, push-pull R363.222
Amplifiers, a-f, resistance-coupled R363.211
Amplifiers, a-f R363.2
Amplifier, band-pass r-f R363.12
Amplifiers, class AB, a-f R363.222.1
Amplifiers, r-f, class B R363.14
Amplifiers, class C, r-f R363.15
Amplifiers, direct-current R363.3
Amplifiers, feed back, a-f R363.23
Amplifiers for receivers R363
Amplifiers, harmonic R213.1, R357.1
Amplifiers, impedance coupled, a-f R363.213
Amplifiers, intermediate frequency, I.F. R363.13
Amplifiers, intermediate, measurement R255.3
Amplifiers, linear, r-f R363.141
Amplifiers, measurement R255.1
Amplifiers, measurement using square wave R255.13
Amplifiers, power R355.7
Amplifiers, power, measurement R255.5
Amplifiers, radio-frequency R363.1
Amplifiers, r-f, tuned-voltage, receiver R363.11
Amplifiers, shunt feed, a-f R363.212.1
Amplifiers, speech, measurement R255.4

Amplifier theory of vacuum tubes R132
Amplifiers, transformer coupled, a-f R363.212
Amplifiers, velocity modulation, r-f R363.16
Amplifiers, video R363.4
Amplifiers, video power R363.42
Amplifiers, video voltage R363.41
Amplifiers, voltage, a-f R363.21
Amplifying action of vacuum tubes R132
Amplifying apparatus, receiver, measurement R263
Amplitude distortion, measurement R255.12
Amplitude modulation R148.1
Amplitude modulation measurement R254.11
Amplitude modulation measurement by cathode-ray oscillograph R254.112
Amplitude modulation transmitters R423.7
Ammeters R242.1, 621.374.4
Ammeters, hot-wire R242.11
Analysis of gas by use of vacuum tubes 621.375.605
Analysis, vacuum tube circuit R139.1
Analysis, television image R583.11
Analysis of wave form 537.7
Analyzer, spectrum R371.2
Analyzer, wave R371.1
Anomalies, ionosphere R113.617
Antennas R120, R320
Antenna, Adcock R125.4, R325.4
Antenna, aircraft R326.21, R525
Antenna, all-wave type R326.1
Antenna, arrays R125.1, R325.11
Antenna, artificial R327
Antenna, automobile R326.22
Antenna, beam R125.1, R325.1
Antenna, Beverage R325.21
Antenna, broadcast R326.4
Antenna, capacitance top R321.211
Antenna, coil R125.3, R325.3
Antenna, condenser type R121
Antenna, conical R326.612
Antenna coupling units R320.51
Antenna, cylindrical R326.611
Antenna, diamond R326.614
Antenna, direction finder R125.31, R325.31
Antenna, direction finder, null type R325.311
Antenna, directional R125, R325
Antenna, double diamond R326.615
Antenna, doublet R321.31
Antenna feeders R128, R320.4
Antenna, fish-bone R325.113.1
Antenna, flag-pole type R321.4
Antenna grounds R320.3
Antenna, half-wave R321.3
Antenna, high-angle for short distance work R125.7
Antenna, horn radiators R325.8

Antenna, image R127
Antenna, linear R122
Antenna, long-wave R326.3
Antenna, low-angle for long distance work R125.8
Antenna, low frequency R321.1
Antenna markers R320.7
Antenna measurements R221
Antenna, microwave R326.8
Antenna, multifrequency tuned R326.25
Antenna, multiple tuned R129.1, R321.11
Antenna, non-resonant radiating R125.62
Antennas, other types R129
Antenna, parasitic R321.34
Antenna phasing equipment R320.5
Antenna phasing units R320.51
Antenna, radar R537.11
Antenna, radiating efficiency R120.2
Antenna, radiated power from R120.21
Antenna, resonant radiating R125.61
Antenna, ring system R321.22
Antenna, rhombic R325.5
Antenna, ship R326.23
Antennas, short-wave R326.5
Antenna, single-wire R321.2
Antenna, spheroidal R326.613
Antenna, standard dipole, method of measuring field intensity R271.12
Antenna, standard, method of measuring field intensity R271.1
Antenna, steerable, multiple unit (Musa) R325.51
Antenna switches R320.6
Antenna systems R320
Antenna systems, capacitor type R321
Antenna systems, directional R325
Antenna systems, mobile R326.2
Antenna, tank R326.24
Antenna, television R326.6
Antenna towers R320.8
Antenna, tower type R321.5
Antenna, transmission line R125.5
Antenna, turnstile R321.32
Antenna, ultra-high frequency R326.7
Antenna, vertical directional pattern of R120.1
Antenna, vertical directional pattern of ground reflection as affecting R120.11
Antenna, vertical grounded wire R321.21
Antenna, vertically radiating R125.6
Antenna, V, resonant R325.6
Antenna, wave R125.2, R325.2
Antenna, wave guide R326.81
Antenna, wide-band R326.61
Antenna with corner reflector R325.71
Antenna with inductance top R321.212

Antenna with parabolic reflector R325.72
Apparatus, arc transmitting R153
Apparatus, general, for radio measurements R201
Apparatus, generating (except vacuum tubes) R150
Apparatus, receiving R160, R360
Apparatus, spark transmitting R152
Applications of radio R500
Applications of vacuum tubes other than radio 621.375*
Arcs, incandescent 621.325
Arc transmitters R353
Arc transmitting apparatus R153
Armstrong system of frequency modulation R423.81
Army, use of radio by R561
Array, antenna R125.1, R325.11
Array, broadside R325.112
Array, end-fire R325.113
Array, multiple R325.115
Array, polyphase antenna R321.33
Array, rectangular, antenna R325.111
Array, two-element R325.114
Array, Yagi R321.341
Arrestors, lightning R358.1
Artificial antennas R327
Astronomy 520
Asymmetric side-band transmitters R423.5
Atmosphere, constitution of R113.502
Atmospheric direction measurement R272.2
Atmospheric intensity measurement R272.1
Atmospheric radio noise, calculation R114.3
Atmospheric radio noise, diurnal variations R114.11
Atmospheric radio noise, effects of receiving antenna on R114.8
Atmospheric radio noise, field intensity required to overcome R114.7
Atmospheric radio noise, geographical variations R114.13
Atmospheric radio noise, measurement of R272
Atmospheric radio noise prediction R114.4
Atmospheric radio noise, propagation R112.7, R114.2
Atmospheric radio noise, seasonal variations in R114.12
Atmospheric radio noise sources R114.1
Atomic physics 539
Attenuation measurements R247
Attenuation of wave guides R118.7
Attenuator network R383.21
Attenuators R396
Attenuators, miscellaneous types of R396.9
Attenuators, mutual capacitance type R396.3
Attenuators, mutual inductance type R396.2
Attenuators, resistance type R143.1, R396.1
Audio-frequency amplifiers R363.2
Audio-frequency bridges in measurements R207.2
Audio-frequency choke coils R217.121
Audio-frequency meter R211.2, R374.2
Audio-frequency oscillators R355.914

Audio-frequency transformer R382.12
Audio-modulated beacon systems for aircraft R526.112
Automatic frequency control system of FM R423.82
Automatic frequency control for receivers R361.215
Automatic transmitters R359
Automatic volume control (AVC) R361.201
Automatic volume control measurement R261.7
Automobile antenna R326.22
Automobile ignition interference R430.24
Automobile receiver R361.118

Balanced and unbalanced lines R117.14
Ballast resistance regulator R366.153
Band spread, frequency R361.207
Band width of modulation R148.14
Barkhausen-Kurz oscillator R355.912.2
Batteries, primary 621.353
Batteries, receiver power supply R366.12
Batteries, secondary or storage 621.354
Batteries, transmitter power supply R356.12
Battery charging devices 621.354.7
Beacons, marine radio R512.11
Beacon, radar R537.2
Beacon systems, audio modulated for aircraft R526.112
Beacon systems, coded for aircraft R526.111
Beacon system cone of silence marker R526.154
Beacon systems, course identification R526.114
Beacon systems, equi-signal, aircraft R526.11
Beacon system fan markers for aircraft R526.153
Beacon systems for aircraft R526.1
Beacon system markers R526.15
Beacon systems, non-directional for aircraft R526.13
Beacon system obstruction markers for aircraft R526.152
Beacon systems, omnidirectional for aircraft R526.12
Beacon system route markers R526.151
Beacon systems, simultaneous phase for aircraft R526.113
Beacon systems, timed-rotating, for aircraft R526.14
Beam antennas R125.1, R325.1
Beam, electron, deflection R138.312
Bearing deviation of radio waves R115.3
Beat-frequency meter, a-f R374.22
Beat-frequency oscillator R355.911.3, R355.914.2
Beat indicators, in radio measurements R206.1
Beat interference R171
Beat notes, use of, in measurements R206
Beat reception R426
Beats, theory R147
Beverage antenna R325.21
Bibliographies, radio R055
Biconical type radiator R325.84
Biographical R097
Bolometer bridge, use in measurements R242.3

Bolometer method of power measurement R245.2
 Bonding of aircraft R522.2
 Boxes, resistance, decade R383.23, 621.374.2
 Bridge, audio-frequency, in measurements R207.2
 Bridge balance indicators R207.3
 Bridge, bolometer, use in measurements R242.3
 Bridge methods, high frequency, in radio measurements R207
 Bridge method of resistance measurement R241.5
 Bridge, radio-frequency R207.1, R244.2
 Bridge-stabilized oscillator R355.911.411
 Bridge, Wheatstone 621.374.2
 Broadcast antennas R326.4
 Broadcasting, radio R550
 Broadcasting station, FM R630
 Broadcast receiver R361.116
 Broadside array R325.112
 Bulletins, radio R009
 Burglar alarms R597
 Bursts, ionosphere R113.617.6
 Business methods 658
 Buzzers R385.2
 Buzzer type frequency meter R211.121, R374.121

 Cabinets, temperature controlled R214.11
 Cable, high-frequency R117.2
 Cable relations with radio traffic R531.6
 Cable, submarine 621.382.8
 Calculation of atmospheric radio noise R114.3
 Calculation of radio waves, great-circle path R115.1
 Calculators R078
 Calibration of electrical instruments 621.372
 Calibrator, range R371.6
 Call letters, radio station R531.2
 Calorimeter method of power measurement R245.6
 Calorimeter method of resistance measurement R241.4
 Capacitance, distributed, of coils, measurement R215.2
 Capacitance, internal, measurement of receiving tubes R262.6
 Capacitance, internal, measurement, of transmitting tubes R252.6
 Capacitance measurement R215
 Capacitance meter R215.4
 Capacitive coupling R142.5
 Capacitive reactance R145.5
 Capacitors R381
 Capacitors, air R381.13
 Capacitors, air dielectric, measurement R215.11
 Capacitors, ceramic R381.12
 Capacitors, ceramic dielectric, measurement R215.15
 Capacitors, electrolytic R381.14
 Capacitors, fixed R381.1
 Capacitors for radio receivers, measurement R264.1
 Capacitors, gas dielectric, measurement R215.14
 Capacitors, measurement R215.1

Capacitors, mica R381.11
 Capacitors, mica dielectric, measurement R215.12
 Capacitors, neutralizing, measurement R215.111
 Capacitors, padding R381.22
 Capacitors, paper R381.15
 Capacitors, paper dielectric, measurement R215.13
 Capacitors, % of R215.3
 Capacitors, transmitting, measurements R253
 Capacitor type voltage divider measurements R243.72
 Capacitors, vacuum R381.16
 Capacitors, vacuum type, measurement R215.16
 Capacitors, variable R381.2
 Capacitors, variable air R381.21
 Capacitors with other types of dielectrics R215.19
 Carbon microphones R385.51
 Carrier suppression R148.15
 Cathode follower circuit R139.21
 Cathode-ray oscillograph R371.5
 Cathode-ray oscillograph, use of in measurements R201.7
 Cathode-ray tubes R138.31
 Cavity frequency meter R211.111, R374.111
 Cavity resonator R119
 Cavity resonator coupling R119.35
 Cavity resonator, impedance R119.34
 Cavity resonator, nonreentrant type R119.1
 Cavity resonator, properties of R119.3
 Cavity resonator, reentrant type R119.2
 Cells, Kerr 535.38*
 Cells, standard 621.374.3
 Ceramic dielectric capacitors, measurement R215.15
 Chamber, test, for use at various humidities R283.1
 Chamber, test, for use at various pressures R283.1
 Chamber, test, for use at various temperatures R283.1
 Changers, frequency R357
 Characteristics of piezo resonators, electrical R214.21
 Charging devices for batteries 621.354.7
 Charts, radio R084
 Chemical process control by vacuum tubes 621.375.151
 Chemical tests, miscellaneous use of vacuum tubes in 621.375.609
 Chemistry 540
 Chemistry, physical 541.3
 Choke coils 621.314.6
 Choke coils, audio-frequency, measurement R217.121
 Choke coils, radio-frequency, measurement R217.111
 Choppers R385.3
 Chronometers 681.114.4
 Ciphers, radio R531.1
 Cipher system for data exchange R539.12
 Circuit, alignment, receiver R361.213
 Circuit analysis, vacuum tube R139.1
 Circuit arrangements of radio receiving set R162
 Circuit arrangements, special vacuum tube R139.2

Circuit, cathode follower R139.21
Circuit, impulse excitation R141.3
Circuit, parallel resonance R141.22
Circuit, radio, resonance of R141.2
Circuit, radio, tuning of R141.2
Circuit resonance method R211
Circuit, series resonance R141.21
Circuit theory and effects R140
Circuit, time constant R141.23
Circuits, coupled R142
Circuits, radio, frequency of R141.1
Circuits, simple radio R141
Circuits, transient effect in radio R140
Citizens radio communications R544
Clocks 529.78
Clocks, electric 681.116
Coast Guard, use of radio by R568
Coaxial conductor method of measurement R208
Coaxial lines R320.412
Codan R361.201.1
Code, alphabet, radio R531.4
Code, continental R531.4
Code, international R531.4
Code, Morse R531.4
Codes, radio R531.1
Code systems, synoptic, for data exchange R539.11
Code training oscillator R355.914.6
Coil antennas R125.3, R325.3
Coil antenna combined with vertical antenna R325.32
Coil, audio-frequency choke R217.121
Coil, choke 621.314.6
Coil, choke, radio-frequency measurement R217.111
Coil comparators R217.4
Coil, distributed capacitance, measurement R215.2
Coil, induction 621.314.7
Coil, measurement of Q R217.3
Coils for radio receivers, measurement R264.2
Collections, radio R080
Collision prevention devices for aircraft R526.4
Collision prevention, marine R512.3
Color measurement or test, use of vacuum tubes in 621.375.601
Colpitts oscillator R355.911.13
Combustion control by vacuum tubes 621.375.152
Commercial radio service R530
Communication, electric 621.38
Communications, citizens radio R544
Communications, railroad R533
Communications receiver R361.117
Communication systems, radio R400
Comparators, coil R217.4
Compass, marine radio R512.13
Component parts R380

Concentric conductors R117
Condensers, measurement R215.1
Condenser microphone R385.53
Condenser transmitters 621.385.95*
Condenser type antennas R121
Condenser type loudspeakers R365.24
Conductance, grid, measurement of receiving tubes R262.2
Conductance, grid, measurement of transmitting tubes R252.2
Conductance, mutual, measurement of receiving tubes R262.5
Conductance, mutual, of transmitting tubes R252.5
Conductance, plate, of receiving tubes, measurement of R262.3
Conductance, plate measurement, of transmitting tubes R252.3
Conducting materials, properties of electrical R282
Conduction of r-f and a-f by transmission lines R117.11
Conductivity of solutions, use of vacuum tubes in 621.375.602
Conductor, coaxial, method of measurement R208
Conductors, concentric R117
Conductors, concentric, in impedance measurements R244.5
Conductors, metallic, properties of R282.1
Conferences, international, radio R007.9
Conical antenna R326.612
Conical type radiator R325.83
Constant-current system of plate modulation R148.521
Constant-current system of plate modulation, modified R148.522
Constant frequency oscillator R355.911.4
Constants of ground R113.509
Constant, time, of radio circuit R141.23
Construction application for radio station R621.1
Construction permit for radio station R621.1
Contact resistance theory R144
Continental code R531.4
Continuous wave system R420
Control, automatic frequency, for receivers R361.215
Control, automatic, of aircraft R527
Control, frequency, of transmitters R355.6
Control, manual volume R361.202
Control, remote, at fixed point R570.5
Control, remote, by radio R570
Control, remote, by wire R440
Control, remote, of aircraft R570.1
Control, remote, of land craft R570.3
Control, remote, of marine craft R570.2
Control, remote, of missiles R570.4
Control, remote, of radio receiving equipment R367
Control system of FM, automatic frequency R423.82
Control, tone R361.203
Control, voltage, equipment 621.314.51*
Control, volume, automatic R361.201
Control by vacuum tubes 621.375.1, 621.375.13, 621.375.15
Control of chemical process by vacuum tubes 621.375.151
Control of combustion by vacuum tubes 621.375.152
Control of devices by vacuum tubes 621.375.13

Control of doors by vacuum tubes 621.375.131
Control of electric load by vacuum tubes 621.375.101
Control of electroplating by vacuum tubes 621.375.153
Control of heat by vacuum tubes 621.375.4
Control of humidity by vacuum tubes 621.375.102
Control of illumination by vacuum tubes 621.375.103
Control of moisture content by vacuum tubes 621.375.102
Control of motion by vacuum tubes 621.375.104
Control of motors by vacuum tubes 621.375.133
Control of pressure by vacuum tubes 621.375.105
Control of processes by vacuum tubes 621.375.15
Control of switching by vacuum tubes 621.375.106
Control of synchronization by vacuum tubes 621.375.107
Control of temperature by vacuum tubes 621.375.108
Control of traffic by vacuum tubes 621.375.109
Control of welding by vacuum tubes 621.375.154
Conversion of frequency R148.41
Converter, phase 621.313.68
Converter tubes in superheterodynes R335
Copper-oxide rectifier R366.34
Copper-oxide rectifier type voltmeter R243.5
Cores, powdered iron R217.122
Corona discharge 537.26*
Cosmic effects, radio wave propagation R113.4
Cosmic noise R113.414
Cosmic radiation, effect on radio waves R113.413
Coulometers 621.374.4
Countermeasures, radar R537.9
Counting of objects by vacuum tubes 621.375.2
Coupled circuits R142
Coupling, capacitive R142.5
Coupling, direct R142.1
Coupling, inductive R142.3
Coupling to cavity resonator R119.35
Coupling units, antenna R320.51
Course identification, beacon systems R526.114
Coverage of FM R530.11
Coverage of television R583.16
Cross modulation R148.19
Cross modulation in receivers R361.210
Cross talk measurement in receiving sets R261.52
Cross talk in receivers R361.210
Crystal-controlled receivers R361.209
Crystal detectors R362.1
Crystal rectifier type voltmeter R243.6
Current measurements, r-f R242
Current regulator tubes R338.1
Current transformer, use in measurements R242.2
Curves, characteristic, of receiving tubes R262.1
Curves, characteristic, of transmitting tubes R252.1
Curves, characteristic, of vacuum tubes R131
Cyclograph 621.375.608
Cylindrical antenna R326.611

Damped wave system R410
Damping R114.1
Data exchange by radio R539.1
Data exchange, cipher systems for R539.12
Data exchange, synoptic code systems R539.11
Data, operating, for radio propagation analysis R531.8
D-c power line transmitter supply R356.11
Decade resistance boxes R383.23, 621.374.2
Decrement R144.1
Decrementors R374.5
Definitions, radio R032
Deflection of electron beam R138.312
Deflection of scanning beam, television R583.13
Dehydration of food, by vacuum tubes 621.375.41
Demodulating dividers, frequency R357.32
Density measurement by vacuum tubes 621.375.603
Department of Justice, radio application R538.1
Design and planning of radio station R622
Design, radio R004
Detection of smoke, use of vacuum tubes in 621.375.613
Detector action of vacuum tubes R134
Detector, crystal R362.1
Detector, diode R362.21
Detector, electrolytic R362.4
Detector, grid-leak power R362.22
Detector, magnetic R362.3
Detectors, R362
Detector section of superheterodyne receiver R361.102.4
Detector, square law R362.23
Detector tubes R332
Detector, vacuum tube type R362.2
Developments in other countries, radio R000.1
Deviations, bearing, of radio waves R115.3
Devices, control of, by vacuum tubes 621.375.13
Devices, electro-acoustic 621.385.97*
Devices, keying R385
Devices, modulation R385
Devices, protective R358
Diamond antenna R326.614
Diathermy R594.1
Diathermy, condenser field application R594.11
Diathermy, induction field application R594.12
Diathermy interference R430.231
Dielectric constants of gases R216.3
Dielectric constants of liquids R216.2
Dielectric constant measurement R216
Dielectric constants of solids R216.1
Diodes, cold-cathode R339.11
Diode detector R362.21
Direct coupling R142.1
Direct-current amplifiers R363.3

Direct-current generators 621.313.23
Direct-current machinery 621.313.2
Direct-current motors 621.313.24
Direct-current supply for radio receivers R366.1
Direction finder antennas R125.31, R325.31
Direction finder antennas, null type R325.311
Direction finder, electrically-switched type R325.312
Direction finders for aircraft R526.3
Direction finding stations R619
Direction finding, marine R512.13
Discharge, corona 537.26*
Distance finding, marine R512.14
Distance, skip, of radio waves R112.5
Distance, sparking R243.2
Distortion, amplitude, measurement R255.12
Distortion in radio receivers R161.7
Distortion measurement of receiving tubes R262.93
Distortion meter R255.2
Distortion, modulation R148.11
Distress signals, marine R511
Distributed capacitance of coils, measurement R215.2
Disturbances, ionosphere R113.617
Disturbances, sudden ionosphere R113.103.1, R113.619.1
Diversity receiver R361.107
Diversity receiving systems R428
Dividers, demodulating, frequency R357.32
Dividers, frequency R213.2, R357.3
Dividers, voltage, measurement R243.7
Dividers, voltage, measurement, capacitor type R243.72
Dividers, voltage, measurement, resistor type R243.71
Doctor's call service R547.1
Door control by vacuum tubes 621.375.131
Double diamond antenna R326.615
Double modulation R148.4
Doubler, frequency R357.22
Doublet antenna R321.31
Duplex system R460
Dynamic loudspeakers R365.22
Dynamic or moving coil microphones R385.52
Dynamotor 621.313.26
Dynamotor, d-c power supply for transmitters R356.141
Dynatron oscillator R355.911.21
Dynatron type of frequency meter R211.123, R374.123

Earth 525
Earth, electrical properties R282.11
Echo box R211.112, R374.112
Echoes, spread, ionosphere R113.617
Eclipses, effect on radio wave propagation R113.112
Eclipses of the sun 523.78
Education by radio R557
Education, radio R070
Effects, cosmic radiation on radio wave propagation R113.413

Effects, geophysical, on radio wave propagation R113.5
Effects, ground reflections on ionosphere R115.5
Effect, hum, modulation R148.7
Effects of humidity on radio equipment R284
Effects, lunar, on radio wave propagation R113.410
Effects, magneto-ionic, on ionosphere R113.508, R113.613
Effects, meteorological, on ionosphere R113.501.3
Effects, meteorological, on radio wave propagation R113.501
Effect, noise, modulation R148.7
Effect of eclipses on radio wave propagation R113.412
Effect of meteors on radio waves R113.415
Effects, polarization, on directional properties of radio waves R115.7
Effects of receiving antenna on atmospheric radio noise R114.8
Effect, skin R144.2
Effects, solar, on radio wave propagation R113.4
Effect of temperature on radio equipment R283
Effects, transient, in circuits R140
Efficiency, radiating, of antenna R120.2
Electric clocks 681.116
Electric communication 621.38
Electric generator 621.313
Electric load control by vacuum tubes 621.375.101
Electric motors 621.313
Electric phonograph 621.385.971*
Electrical engineering 621.3
Electrical fields, experimental plotting 537.67*
Electrical measurements 621.37
Electrical meters 621.37
Electrical methods of prospecting 622.12
Electrical phenomena, physiological 537.87
Electricity 537
Electricity, theory of 537.1
Electroacoustic devices 621.385.97*
Electroacoustic transducers, measurement R265
Electrocardiography R594.3
Electrodynamometer, use in measurements R242.14
Electrodynamics 537.6
Electrolytes, properties of R282.2
Electrolytic capacitor R381.14
Electrolytic detector R362.4
Electrometers 621.374.3
Electron beam deflection R138.312
Electron-coupled oscillator R355.911.17
Electron emission, vacuum tubes R138
Electron gun R138.311
Electron microscope 621.375.604
Electron optics R138.3
Electron oscillations R138.4
Electron transit time R138.5
Electronic a-f meter R211.23, R374.23
Electronic switch R371.51
Electronic switching R257.2
Electroplating control by vacuum tubes 621.375.153

Electrostatic generator 537.23
Electrostatic voltmeter R243.3
Electrosurgery R594.2
Electrosurgical appliance interference R430.232
Electrosurgical appliance (spark) interference R430.232.1
Elevator levelling by vacuum tubes 621.375.132
Elimination of interference R430
Emergency services, special R547
End-fire array R325.113
Engineering construction, use of radio in R596
Engineering, electrical 621.3
Engineering, mechanical 621
Engineers relations with public, radio R071
Equalizers R143.3
Equipment, microwave R310
Equipment, protective R387
Equipment, radio station R610
Evacuation of vacuum tubes R331
Executive, radio R005
Excitation, impulse of radio circuit R141.3
Excitation of modes of wave guides R118.6
Exhibits, radio R074
Experiment stations, radio R072

Facsimile, history of R096
Facsimile including photographs R581
Facsimile by wire 621.382.7
Factor, modulation R148.12
Factories, radio R710
Factor, screen mu, measurement of receiving tubes R262.92
Fading, absorption, of radio waves R113.103
Fading, flutter, of radio waves R113.104
Fading, interference, of radio waves R113.101
Fading, polarization, of radio waves R113.102
Fading, radio waves, R113.1
Fading, selective, of radio waves R113.107
Fading, skip, of radio waves R113.105
Fading, sunrise-sunset R113.106
Feed-back a-f amplifiers R363.23
Feed-back oscillator R355.911.1, R355.914.1
Feeders, antenna R128, R320.4
Fidelity measurement of radio receiving sets R261.3
Fidelity of radio receiver R161.3
Field intensity, calibrated loop antenna method of measurement R271.11
Field intensity, measurement R271
Field intensity, measurement by standard field generator method R271.2
Field intensity, measurement by substitution method R271.111
Field intensity record interpretation R271.4
Field intensity recorder for continuous measurement R271.3
Field intensity recorder, meter type R271.32
Field intensity recorder, potentiometer type R271.31
Field intensities required to overcome atmospheric radio noise R114.7
Field intensities, sky wave R112.6
Field intensity, standard antenna method of measurement R271.1

Field intensity, standard dipole method of measurement R271.12
Field intensities vs. atmospheric absorption R113.22
Figure of merit of traffic circuit R531.83
Filters R143.2, R386
Filter, band-eliminator R386.4
Filter, band-pass R386.1
Filter, crystal (piezoelectric) R386.3
Filter, high-pass R386.3
Filter, low-pass R386.2
Filter, power line noise eliminator type R386.41
Filter, power pack type R386.6
Filter, rectifier, for receiver power supply R366.37
Filter, rectifier, for transmitter R356.231
Filter, scratch eliminator R386.21
Filter system for single side-band transmitters R423.51
Fire alarm transmitters R359.4
Fire services, use of radio by R543
Fishing boats R513
Fish-bone antenna R325.113.1
Flag-pole type antenna R321.4
Fluorescent screen R138.313
Flutter fading of radio waves R113.104
Fluxmeter 621.375.624
FM, Armstrong system R423.81
FM, automatic frequency control system of R423.82
FM coverage R630.11
FM measurement R254.12
FM Morrison system of R423.83
FM networks R630.24
FM plans R630.12
FM progress R630.12
FM propagation R630.11
FM receivers R361.111, R630.25
FM stations R630.2
FM studio equipment R630.22
FM studio-transmitter links R630.23
FM transmitters R423.8, R630.21
Fog signalling, marine R512.12
Forestry, radio applications in R535
Fractional frequency generators R213.2, R357.33
Frequency band spread R361.207
Frequency changers R357
Frequency control, automatic, of radio receiver R361.215
Frequency control of transmitters R355.6
Frequency conversion R148.41
Frequency, critical, of the ionosphere R113.602.1, R113.611.1
Frequency, cut-off, of wave guides R118.5
Frequency demodulating dividers R357.32
Frequency diversity receiver R361.107.1
Frequency diversity transmitter R423.21
Frequency dividers R213.2, R357.3
Frequency doublers R357.22
Frequency, lowest useful high (luhf) R112.8
Frequency, maximum useful high (muhf) R112.5, R113.21

Frequency measurements R210
Frequency measurement, harmonic methods R213
Frequency measurement, parallel wire method R212
Frequency meter R211, R374, 621.374.7
Frequency meter, audio R211.2, R374.2
Frequency meter, beat type R211.22, R374.22
Frequency meter, audio, electronic R211.23, R374.23
Frequency meter, tuned circuit R211.21, R374.21
Frequency meter, radio R211.1, R374.1
Frequency meter, absorption type R211.11, R374.11
Frequency meter, buzzer driven type R211.121, R374.121
Frequency meter, cavity R211.111, R374.111
Frequency meter, dynatron type R211.123
Frequency meter, generating type R211.12, R374.12
Frequency meter, heterodyne type R211.122, R374.122
Frequency mixers R357.4
Frequency modulation R148.2
Frequency modulation broadcasting stations R630
Frequency modulation measurement R254.12
Frequency modulation receiver R361.111, R630.25
Frequency modulation, theory R630.1
Frequency monitor R211.124, R384.124
Frequency multipliers R357.2
Frequency of cavity resonator R119.32
Frequency of radio circuits R141.1
Frequency range change, receiver R361.206
Frequency standards, piezo-electric R214
Frequency triplers R357.22
Frequency usage, comparison with ionosphere conditions R531.85
Frequency usage prediction, for traffic circuit R531.84
Frequency usage of traffic circuit R531.82
Fungus growth deterrents on radio equipment R284.1
Fuses R358.5

Galvanometers 621.374.4
Gas detection and analysis by vacuum tubes 621.375.605
Gas dielectric capacitors, measurement R215.14
Gases 533
Gases, dielectric constant measurement R216.3
Gas-filled tube oscillator R355.914.43
Gas tubes R337.1
Generating action of vacuum tubes R133
Generating action of vacuum tubes with negative grid R133.1
Generating action of vacuum tubes with positive grid R133.2
Generating action of vacuum tubes, relaxation oscillation R133.3
Generating apparatus, general R350
Generating apparatus, measurement R250
Generating apparatus, theory (except vacuum tubes) R150
Generating type of frequency meter R211.12, R374.12
Generators, alternating-current 621.313.43
Generators, alternating-current transmitter power supply R356.22
Generators, direct-current 621.313.23
Generators, direct-current transmitter power supply R356.14

Generators, electric 621.313
Generators, electrostatic 537.23
Generators, for receivers R366.14
Generators, fractional frequency R213.2, R357.33
Generators, harmonic R213.1, R357.1
Generators, saw-toothed R355.914.432
Generators, square wave R355.913.4
Generators, standard field, measurement of field intensity method R271.2
Generators, standard pulse R355.913.3
Generators, standard voltage R355.913.2
Generators, time base R355.913.5
Generators, time interval R355.914.433
Geodesy 526
Geology 550
Geophysical effects on radio wave propagation R113.5
Geophysical prospecting, radio applications in R536
Gluing by vacuum tubes 621.375.42
Grading process, by vacuum tubes 621.375.3
Graphs on propagation conditions R113.72
Grid-bias modulation R148.512
Grid conductance, measurement of receiving tubes R262.2
Grid conductance of transmitting tubes R252.2
Grid-current modulation R148.511
Grid modulation R148.51
Ground constants R113.509
Grounding of radio equipment R201.5
Grounds R387.5
Grounds, antenna R320.3
Ground reflection, effect on ionosphere R115.5
Ground reflection effect on radio waves R115.5
Ground systems R126
Ground telegraphy 621.382.92*
Guides, wave R118
Gun, electron R138.311
Gyrofrequency for radio waves R113.614

Half-wave antenna R321.3
Hardness test, use of vacuum tubes in 621.375.606
Harmonics R146
Harmonic amplification R146.1
Harmonic amplifiers R213.1, R357.1
Harmonic generators R213.1, R357.1
Harmonic methods, in radio measurements R203
Harmonic methods, of frequency measurement R213
Harmonic radiation suppression R146.3
Hartley oscillator R355.911.11
Hearing aids R594.4
Heat 536
Heating control by vacuum tubes 621.375.4
Heating by induction 536.83
Heating, industrial R598
Heat radiation, theory 536.33
Height, virtual, of the ionosphere R113.602.21

Heil tube oscillator R355.912.4
Heising system of plate modulation R148.521
Heterodyne reception R163
Heterodyne type frequency meter R211.122, R374.122
Heterodyne type wave analyzer R371.11
High-angle antenna R125.7
High-fidelity reproduction R361.204
High-frequency bridge methods, measurements R207
High-level modulation R148.514
High-speed telegraph 621.382.4
High-voltage interlocks R358.4
History of facsimile R096
History of radiotelegraphy R091
History of radiotelephony R094
History of radio transmission R094.1
History of reception R094.2
History of television R095
History, radio R090
Horn radiator antennas R325.8
Household appliance interference R430.22
Hum effect, modulation R148.7
Hum measurement of receiving sets R261.51
Humidity control by vacuum tubes 621.375.102
Humidity, effects on radio equipment R284
Hydrostatics 532

Ignition interference from automobiles R430.24
Ignition shielding on aircraft R521.2
Ignition systems, use of vacuum tubes in 621.375.5
Illumination control by vacuum tubes 621.375.103
Image analysis, television R583.11
Image antennas R127
Image reproduction, television R583.15
Impedance R117.12, R145
Impedance of cavity resonator R119.34
Impedance matching by network R117.121
Impedance matching by quarter-wave coupling line R117.123
Impedance matching by reentrant transmission line section R117.125
Impedance matching by resonant line coupling R117.122
Impedance matching network R383.22
Impedance matching system, stub-line R117.124
Impedance measurements R244
Impedance measurement, concentric conductors R244.5
Impedance measurement, parallel resonance method R244.12
Impedance measurement, series resonance method R244.11
Impedance measurements, special instruments R244.3
Impedance measurement, substitution method R244.1
Impedance measurement, transmission lines R244.4
Impulse excitation of radio circuit R141.3
Impulse excitation system R413
Incandescent arcs 621.325
Incandescent filament lamps 621.326
Indicating instruments, electrical R372

Indicator, beat, for radio measurements R206.1
Indicator, bridge balance R207.3
Indicator, radar R537.131
Indicators, standing wave R371.7
Inductance measurements R217
Inductance, mutual measurement R217.2
Inductance, self, measurement of R217.1
Induction coils 621.314.7
Induction heating 536.83
Induction signalling 621.382.94
Inductive coupling R142.3
Inductive output tube oscillator R355.912.5
Inductive reactance R145.3
Inductors R382
Inductors, air-cored, measurement R217.11
Inductors, iron-cored, measurement R217.12
Industrial heating R598
Industrial heating equipment interference R430.25
Instrument landing, aircraft R526.2
Instrument landing beam R526.21
Instrument landing markers for aircraft R526.22
Instrument landing runway localizer R526.23
Instruments, calibration of electrical 621.372
Instruments, electrical indicating R372
Instruments for measuring time 529.78
Instruments, musical R593
Instruments, radio R370
Instruments, special, for impedance measurements R244.3
Insulating materials, electrical properties of R281
Insulation tester R281.1
Insulators R387.7
Intensity, signal, recorders of R365.32
Interference, automobile ignition R430.24
Interference, beat R171
Interference, diathermy R430.231
Interference, electrosurgical appliance R430.232
Interference elimination R430
Interference fading of radio waves R113.101
Interference, household appliance R430.22
Interference, industrial heating equipment R430.25
Interference, man-made R430.2
Interference output, measurement, of receiving sets R261.5
Interference output of radio receiver R161.5
Interference, power line R430.21
Interference, radio R430.1
Interference, spark electrosurgical appliance R430.232.1
Interference, station R430.11
Interference, therapeutic appliance R430.23
Interference, vacuum tube electrosurgical appliance R430.232.2
Interlocks, high voltage R358.4
Intermediate amplifiers, measurement R255.3
Intermodulation R148.18
Internal capacitance measurement of receiving tubes R262.6

Internal capacitance of transmitting tubes R252.6
International code R531.4
International conference, radio R007.9
International treaties, radio R007.9
Interpretation of field intensity records R271.4
Interpretation of ionosphere records R248.2
Interruptors R385.3
Ionization gages, use of vacuum tubes in 621.375.621
Ionization, vacuum tubes R138
Ionosphere R113.6
Ionosphere absorption recorder R365.334
Ionosphere, anomalies and disturbances R113.617
Ionosphere, bursts R113.617.6
Ionosphere, characteristics of R113.602
Ionosphere conditions, comparison with frequency usage R531.85
Ionosphere, critical frequency R113.602.1, R113.611.1
Ionosphere, description of R113.601
Ionosphere disturbance, sudden, of radio waves R113.103.1, R113.619.1
Ionosphere, D layer R113.607
Ionosphere, effect of ground reflection R115.5
Ionosphere, E layer R113.605
Ionosphere, E2 layer R113.606
Ionosphere fixed frequency (h't) recorder R365.332
Ionosphere, F1 layer R113.603
Ionosphere, F2 layer R113.604
Ionosphere, geomagnetic variations of R113.507
Ionosphere, latitude variations of R113.505
Ionosphere, longitude variations of R113.506
Ionosphere, magneto-ionic effects on R113.508, R113.613
Ionosphere measurements R248
Ionosphere measurements, fixed frequency (h't) R248.11
Ionosphere measurements, manual R248.1
Ionosphere measurements, multifrequency (h'f) R248.12
Ionosphere measurements, phase method R248.14
Ionosphere measurements, pulse methods R248.13
Ionosphere, meteorological effects on R113.501.3
Ionosphere multifrequency (h'f) recorder R365.333
Ionosphere, normal variations of R113.615
Ionosphere, other layers of R113.611
Ionosphere, polar spur on records R113.612
Ionosphere, predictions of conditions R113.616
Ionosphere recorder, manual R365.331
Ionosphere recorders R365.33
Ionosphere record, interpretation R248.2
Ionosphere, scatter phenomena in R113.617.5
Ionosphere scatter recorder R365.335
Ionosphere, sporadic E layer R113.608
Ionosphere, sporadic E2 layer R113.609
Ionosphere, spread echoes R113.617.7
Ionosphere storms, forecasting R113.617.2
Ionosphere storms R113.503
Ionosphere, stratification of R113.610

Ionosphere, sudden disturbances R113.50⁴
Ionosphere, virtual height R113.602.21
Ionospheric absorption R113.22
Iron-cored inductors, measurement R217.12
Irregularities in transmission lines R117.13

Justice Department, radio applications R538.1

Kerr cells 535.38*
Keying devices R385
Keys R385.1
Klystron oscillator R355.912.3

Laboratory oscillators R355.913
Laboratory, radio research R072
Lamps, incandescent filament 621.326
Landing beam instrument R526.21
Land line relations with radio traffic R531.5
Laws, radio R007
Layer, D, of the ionosphere R113.607
Layer, E, of the ionosphere R113.605
Layer, E2 of ionosphere R113.606
Layer, F1, of the ionosphere R113.603
Layer, F2, of the ionosphere R113.604
Layer, sporadic E R113.608
Layer, sporadic E2 R113.609
Layers, other, of ionosphere R113.611
Lectures, radio R040
Licenses, radio station R621.2
Licenses, radio station operators R621.21
Life saving, marine service, by radio R516
Life tests of receiving tubes R262.7
Life tests of transmitting tubes R252.7
Light 535
Lighthouse service R517
Light intensity measurement, use of vacuum tubes 621.375.607
Lightning 537.4
Lightning arrestors R358.1
Light signals 623.731
Line section, reentrant transmission, for impedance matching R117.125
Linear amplifiers, r-f R363.141
Linear antennas R122
Lines, balanced and unbalanced R117.14
Lines, coaxial R320.412
Lines, loaded R117.16
Lines, non-resonant R117.111
Lines, power transmission 621.319.2
Lines, r-f, pressurizing of R117.18
Lines, resonant R117.112
Lines, tapered R117.17
Lines, transmission R117, R320.41
Lines, transmission, conduction of r-f and a-f by R117.11
Lines, transmission, in impedance measurements R244.4

Lines, transmission, irregularities R117.13
Lines, transmission, properties of R117.1
Lines, transmission, radiation R117.15
Links, FM studio-transmitter R630.23
Liquids 532
Liquids, dielectric constant measurement R216.2
Lissajou figures on cathode-ray oscillograph R213.3
Loaded lines R117.16
Localizer, runway, instrument landing R526.23
Longitudinal determinations by radio R551.1
Long-wave antenna R326.3
Loran R512.2
Loudspeakers R165, R365.2
Loudspeaker, condenser type R365.24
Loudspeaker, dynamic type R365.22
Loudspeaker, magnetic armature type R365.23
Loudspeaker measurements R265.2
Loudspeaker, permanent magnet type R365.21
Loudspeakers, piezoelectric type R365.25
Low-angle antenna R125.8
Low-level modulation R148.513
Low-frequency (long wave) antenna R321.1
Luhf R112.8
Lunar effects on radio wave propagation R113.410

Machinery, a-c 621.313.3
Machinery, d-c 621.313.2
Magnetic armature type loudspeaker R365.23
Magnetic detector R362.3
Magnetic materials, properties of R282.3
Magnetic recorders R365.35
Magnetism 538
Magneto-ionic effects on ionosphere R113.508, R113.613
Magnetostriction 538.11*
Magnetostriction oscillators R355.66, R355.911.18, R355.911.42
Magnetron, electronic type oscillator R355.912.11
Magnetron oscillator R355.912.1
Magnetron oscillator, negative-resistance type R355.912.12
Maintenance of radio stations R624
Management of radio stations R625
Man-made interference R430.2
Manufacturing methods, radio R720
Manufacturing processes, radio R720
Map projections 526.8
Maps, radio R084
Marine applications of radio R510
Marine collision prevention R512.3
Marine craft, remote control of R570.2
Marine direction finding R512.13
Marine distance finding R512.14
Marine distress signals R511
Marine, fishing boats R513

Marine fog signalling R512.12
Marine life saving service R516
Marine navigational aid systems R512
Marine position finding R512.1
Marine radio compass R512.13
Markers, antenna R320.7
Markers, beacon system R526.15
Markers, cone of silence beacon system R526.154
Markers, fan, beacon systems for aircraft R526.153
Markers, instrument landing for aircraft R526.22
Markers, obstruction, beacon system for aircraft R526.152
Markers, route, beacon system for aircraft R526.151
Mathematics 510
Materials, properties R280
Mechanical engineering 621
Mechanics 531
Meetings, radio R060
Meissner oscillator R355.911.12
Merchandising, radio R740
Mercury vapor tubes 621.327.4
Message rates R531.7
Metal hardening, by vacuum tubes 621.375.43
Metal locator, surgeon's R594.21
Metallurgy, use of vacuum tubes in 621.375.608
Meteorography, radio R553.1
Meteorological effects on radio wave propagation R113.501
Meteorological recorders R365.36
Meteorological signals R553
Meteorology 551.5
Meteors, effect on radio waves R113.415
Meter, ampere-hour 621.374.4
Meter, capacitance R215.4
Meter, distortion, measurement R255.2
Meter, frequency, see frequency meter
Meter, microfarad R215.4
Meter, modulation, measurement by R254.111
Meter, phase 621.374.91
Meter, phase angle R246.3
Meter, power-factor 621.374.91
Meter, Q R371.4
Meters, special electrical 621.374
Meter, time interval R371.3
Meter, watt-hour 621.374.5
Methods of modulation R148.5
Mica capacitors R381.11
Mica dielectric, capacitors, measurement R215.12
Microfarad meters R215.4
Microphones R385.5
Microphone, carbon R385.51
Microphone, condenser type R385.53
Microphone, dynamic or moving coil type R385.52
Microphone measurements R254.2
Microphone, piezoelectric (crystal) R385.56

Microphone, ribbon, unidirectional R385.54
Microphone, velocity, ribbon type R385.55
Microphonics in radio receivers R361.212
Microscope, electron 621.375.604
Microwave antennas R326.8
Microwave equipment R310
Military radio R560
Mining, radio applications in R536
Miscellaneous radio service R539
Miscellaneous, radio R080
Missiles, remote control of, by radio R570.4
Mixers, frequency R357.4
Mixer tubes in superheterodynes R335
Mobile services, general, use of radio by R542
Modes of excitation of wave guides R118.6
Modes of oscillation of cavity resonators R119.31
Modulated waves, theory of R148
Modulating action of vacuum tubes R135
Modulation, amplitude R148.1
Modulation amplitude, measurement R254.11
Modulation amplitude measurement by cathode-ray oscillograph R254.112
Modulation, amplitude, transmitters R123.7
Modulation, band width R148.14
Modulation, cross R148.19
Modulation devices R385
Modulation devices, vacuum tube R385.4
Modulation distortion R148.11
Modulation, double R148.4
Modulation factor R148.12
Modulation, frequency R148.2
Modulation, grid R148.51
Modulation, grid-bias R148.512
Modulation, grid-current R148.511
Modulation, high-level R148.514
Modulation, low-level R148.513
Modulation measurements R254.1
Modulation methods R148.5
Modulation noise effect R148.7
Modulation, percentage R148.12
Modulation, phase R148.3
Modulation, phase, receiver R361.122
Modulation, plate R148.52
Modulation, plate, constant-current system R148.521
Modulation, plate, modified constant-current system R148.522
Modulation, pulse time R148.6
Modulation side frequencies R148.13
Modulation, single side-band R148.16
Modulation, theory of R148
Modulators R355.8
Modulator, absorption type R355.811
Modulator, amplitude type R355.81
Modulator, balanced type R355.814

Modulator, bridge type R355.815
Modulator, copper-oxide rectifier type R355.815.1
Modulator, double balanced type R355.815.2
Modulator, frequency type R355.83
Modulator, grid type R355.812
Modulator measurements R254
Modulator, phase type R355.82
Modulator, plate type R355.813
Modulator, radar R537.122
Modulator, ring type R355.815.2
Moisture content control by vacuum tubes 621.375.102
Molecular physics 539
Monitor, frequency R211.124, R374.124
Monitor, phase R246.3
Morrison system of FM R423.83
Morse code R531.4
Motion, control by vacuum tubes 621.375.104
Motion pictures R582
Motion picture apparatus 681.134
Motion pictures, sound 681.134.96*
Motor, control of, by vacuum tubes 621.375.133
Motor, direct-current 621.313.24
Motor, electric 621.313
Motor-generators 621.313.25
Motor, induction 621.313.63
Motor, repulsion 621.313.66
Motor, synchronous 621.313.44
Muf R112.5, R113.21
Muf, prediction of R112.54
Multiple array R325.115
Multiple tuned antennas R129.1, R321.11
Multiplex system R460
Multiplier, frequency R357.2
Multiplier, static frequency R421.3
Multivibrators R146.2, R213.2, R355.914.41, R357.21, R357.31
Musa, multiple unit, steerable antenna R325.51
Musa, receiver R361.108
Museums, radio R074
Musical instruments R593
Mutual conductance measurement of receiving tubes R262.5
Mutual conductance of transmitting tubes R252.5
Mutual inductance, measurement R217.2

National Bureau of Standards 353.821*
Navigation, aerial 629.132.5
Navigation, aid to aircraft by radio R526
Navigation signals 534.83
Navigation system, long range, Loran R512.2
Navy, use of radio by R565
Negative-grid resistance oscillator R355.911.24
Negative-resistance oscillator R355.911.2
Negative-resistance push-pull oscillator R355.911.23

Neon tube regulator R366.152
Network, attenuator R383.21
Network, impedance matching R383.22
Network, impedance matching by R117.121
Networks R143
Networks, FM R630.24
Networks, pulse forming R143.5
Networks, time delay R143.4
Neutralizing capacitors, measurement R215.111
Noise, atmospheric radio R114
Noise, atmospheric radio, calculation of R114.3
Noise, atmospheric radio, diurnal variations R114.11
Noise, atmospheric radio, effects of receiving antennas on R114.8
Noise, atmospheric radio, geographical variations R114.13
Noise, atmospheric radio, prediction R114.4
Noise, atmospheric radio, propagation of R112.7, R114.2
Noise, atmospheric radio, required field intensities to overcome R114.7
Noise, cosmic R113.414
Noise effects, modulation R148.7
Noise in receivers R361.211
Noise level, measurement of receiving sets R261.51
Noise, man-made, measurement of R273
Noise meter, radio R273.1
Noise, precipitation R114.5
Noise, radio receiver R161.6, R361.211
Noise, seasonal variations in atmospheric radio R114.12
Noise, sources of atmospheric radio R114.1
Noise, suppressors, interchannel R361.201.1
Nomograms on radio wave propagation conditions R113.73
Nomograms, radio R082
Non-rectangular wave guides R118.2
Non-resonant lines R117.111
Normal output measurement of receiving sets R261.4
Null methods, in radio measurements R204
Null type direction finder antennas R325.311
Ohmmeters R372.1, 621.374.2
Omnidirectional beacon systems for aircraft R526.12
Opacity test, use of vacuum tubes in 621.375.603
Operation of radio stations R623
Operation of vacuum tubes R331.5
Optics, electron R138.3
Oscillations, electron R138.4
Oscillations, modes of cavity resonators R119.31
Oscillations, parasitic R141.5
Oscillations, relaxation R141.4
Oscillator, audio-frequency R355.914
Oscillator, Barkhausen-Kurz R355.912.2
Oscillator, beat-frequency R355.911.3, R355.914.2
Oscillator, bridge-stabilized R355.911.411
Oscillator, code training R355.914.6
Oscillator, Colpitts R355.911.13
Oscillator, constant frequency R355.911.4

Oscillator, dynatron R355.911.21
Oscillator, electron-coupled R355.911.17
Oscillator, feed back R355.911.1, R355.914.1
Oscillator, gas-filled tube R355.914.43
Oscillator, Hartley R355.911.11
Oscillator, Heil tube R355.912.4
Oscillator, inductive output tube R255.912.5
Oscillator, Klystron R355.912.3
Oscillator, laboratory R355.913
Oscillator, magnetostriction R355.66, R355.911.18, R355.911.42
Oscillator, magnetron R355.912.1
Oscillator, magnetron, electronic type R355.912.11
Oscillator, magnetron, negative-resistance type R355.912.12
Oscillator, Meissner R355.911.12
Oscillator, negative-grid resistance R355.911.24
Oscillator, negative resistance R355.911.2
Oscillator, negative resistance push-pull R355.911.23
Oscillator, phase-shift type R355.914.31
Oscillator, piezo R214.1, R355.65, R355.911.41
Oscillator, polyphase R355.911.5
Oscillator, radio-frequency R355.911
Oscillator, radio-frequency, radar R537.121
Oscillator, relaxation R355.914.4
Oscillator, resistance-capacitor type R355.914.3
Oscillator, standard frequency R355.913.1
Oscillator, sweep circuit R355.914.431
Oscillator, transitron R355.911.22
Oscillator tubes R336
Oscillator, tuned-grid R355.911.14
Oscillator, tuned-grid, tuned-plate R355.911.16
Oscillator, tuned plate R355.911.15
Oscillator, tuning-fork stabilized R355.914.5
Oscillator, ultra-high frequency R355.912
Oscillator, vacuum tube R355.91
Oscillator, Van per Pol R355.914.42
Oscillator, velocity modulation R355.912.3
Oscillograph 621.374.7
Oscillograph, cathode-ray R371.5
Oscillograph, cathode-ray, Lissajou figures R213.3
Oscillograph, cathode-ray, use in radio measurements R201.7
Oscilloscope R371.5
Output interference, of radio receiver R161.5
Output, normal, of radio receiver R161.4
Output, normal, of radio receiver, measurement R261.4
Output power of transmitting tubes R252.8
Output power measurement of receiving tubes R262.8
Overload relays R389.18

Padding capacitors R381.22
Panoramic receivers R361.121
Paper capacitors R381.15
Paper dielectric capacitors, measurement R215.13
Parallel resonance method of impedance measurement R244.12

Parallel resonance of radio circuit R141.22
Parallel wires R117; R320.411
Parallel wire methods of frequency measurement R212
Parasitic antenna R321.34
Parasitic oscillations R141.5
Parts, component R380
Patent service 347.7
Pattern, antenna, vertical directional R120.1
Percentage of modulation R148.12
Performance of individual units of radio receivers R261.8
Periodicals, radio R053
Permanent magnet type loudspeakers R365.21
Permittivity R216
Personnel, radio R005
pH measurement, use of vacuum tubes in 621.375.610
Phase adaptor 621.313.68
Phase angle meter R246.3
Phase converter 621.313.68
Phase measurement R246
Phase measurement by cathode-ray tube R246.1
Phase meters 621.374.91
Phase method of ionosphere measurement R248.14
Phase modulation R148.3
Phase modulation, measurement R254.13
Phase modulation receiver R361.122
Phase monitor R246.3
Phase shift by circuit changes of resistance R246.21
Phase shift by electrostatic method R246.23
Phase shift by rotating magnetic field R246.22
Phase shift by vacuum tube method R246.24
Phase shift system for single side-band transmitters R423.52
Phase-shift type oscillator R355.914.31
Phase shifters R246.2
Phasing equipment, antennas R320.5
Phasing units, antenna R320.51
Phenomena, bursts, in ionosphere R113.617.6
Phenomena, photo-electric 535.3
Phenomena, physiological, electrical 537.87
Phenomena, piezoelectric 537.65*
Phenomena, scatter, in ionosphere R113.617.5
Phonograph, electric 621.385.971*
Photo-electric phenomena 535.3
Photo-electric tubes 535.38*
Photographic recorder R391.1
Photographs, facsimile R581
Photography, high-speed, use of vacuum tubes in 621.375.611
Physics 530
Physics, atomic 539
Physics, molecular 539
Picture transmission R580
Picture transmission by wire 621.382.7
Pictures, motion R582.

Pictures, motion, apparatus 681.134
Piezoelectric frequency standards R214
Piezoelectric loudspeakers R365.25
Piezoelectric microphones R385.56
Piezoelectric phenomena 537.65*
Piezoelectricity, principles, applied to radio R191
Piezo oscillator R214.1, R355.65, R355.911.41
Piezo resonator R214.2
Piezo resonator, equivalent electrical characteristics R214.21
Piezo resonator, mechanical overtone operation R214.22
Plans, FM R630.12
Plans for television R583.17
Plastics industry, use of vacuum tubes 621.375.44
Plate conductance measurement, of receiving tubes R262.3
Plate conductance measurement, of transmitting tubes R252.3
Plate modulation R148.52
Plate modulation, constant-current system R148.521
Plate resistance, measurement, of receiving tubes R262.3
Plate resistance of transmitting tubes R252.3
Plotting, experimental, of electrical fields 537.67*
Pneumatics 533
Polarization diversity receiver R361.103.7
Polarization diversity transmitter R423.23
Polarization effects on directional properties of radio waves R115.7
Polarization fading of radio waves R113.102
Polarization, of sky waves R112.9
Police, city and metropolitan, radio use R538.4
Police radio R538
Police, state and county, radio use R538.3
Polyphase antenna array R321.33
Polyphase oscillator R355.911.5
Position finding, marine R512.1
Postal service 383
Power amplifier R355.7
Power amplifier, measurements R255.5
Power amplifier tubes R334
Power detector R362.22
Power factor, measurement R241
Power-factor meters 621.374.91
Power line interference R430.21
Power measurements R245
Power measurement, bolometer method R245.2
Power measurement by calorimeter method R245.6
Power measurement, incandescent filament method R245.4
Power measurement, I²R method R245.1
Power measurement by thermistor method R245.5
Power output of transmitting tubes R252.8
Power output measurement of receiving tubes R262.8
Power, radar R537.3
Power radiated from antenna R120.21
Power rating of transmitting set R251.1
Power supply for radio receiver R366
Power supply for transmitters R356
Power supply measurements R258
Power supply measurements, for radio receivers R261.6

Power supply systems, water-cooled, measurements R258.3
Power transmission lines 621.319.2
Power transmission by radio R591
Prediction of frequency usage for traffic circuit R531.84
Prediction of ionosphere conditions R113.616
Prediction of muf R112.54
Press services R532
Pressure control by vacuum tubes 621.375.105
Pressurizing r-f lines R117.18
Primary batteries 621.353
Principles of piezo-electricity applied in radio R191
Principles of radar R116
Principles of radio R100
Printing telegraph 621.382.5
Prisons, radio in R538.2
Program distribution 621.385.91*
Progress in television R583.17
Propagation analysis from radio operating data R531.8
Propagation, atmospheric radio noise R112.7, R114.2
Propagation, calculation of conditions R113.7
Propagation, cosmic effects on R113.4
Propagation, directional variations of R113.3
Propagation, direct wave R112.11
Propagation, effect of eclipses on R113.412
Propagation, FM R630.11
Propagation, geophysical effects on R113.5
Propagation graphs on conditions R113.72
Propagation, ground, absorption in atmosphere R112.16
Propagation, ground, height-gain function R112.14
Propagation, ground-reflected wave R112.13
Propagation, ground, multipath transmission R112.15
Propagation ground wave R112.1
Propagation, guided wave R112.3
Propagation, handbooks on conditions R113.71
Propagation, irregularities of radio wave R113.24
Propagation of radio waves, lunar effect R113.410
Propagation, meteorological effects on R113.501
Propagation, nomograms on conditions R113.73
Propagation, non-great circle path R115.2
Propagation, radio wave R112, R113
Propagation, sky wave R112.4
Propagation, solar effects on R113.4
Propagation, surface wave R112.12
Propagation, tables on conditions R113.74
Propagation, television R583.16
Propagation, transmission formulas R113.75
Propagation, troposphere R112.2
Propagation, variations R113.2
Properties, directional of radio waves R115
Properties, electrical, of earth R282.4
Properties, electrical, of soil R282.4
Properties of cavity resonators R119.3
Properties of electrical conducting materials R282

Properties of electrical insulating materials R281
Properties of electrolytes R282.2
Properties of fresh water R282.22
Properties of magnetic materials R282.3
Properties of materials R280
Properties of metallic conductors R282.1
Properties of radio waves, directional, polarization effect R115.7
Properties of sea water R282.21
Properties of transmission lines R117.1
Properties of vacuum tubes R131
Processes, control of, by vacuum tubes 621.375.15
Prospecting, electrical methods 622.12
Prospecting, geophysical radio applications in R536
Protective devices R358
Protective equipment R387
Public address systems R391
Publications, radio R050
Pulse generators, standard R355.913.3
Pulse forming networks R143.5
Pulse method of ionosphere measurements R248.13
Pulse time modulation R148.6
Pulse receiver R361.123
Pulse transmitters R351
Push-button tuning R361.205
Push-pull a-f amplifiers R363.222
Pyramidal type radiator R325.82

Q-meter R371.4
Q measurement, of capacitors R215.3
Q of cavity resonator R119.33
Q measurement of coils R217.3
Quarter-wave line coupling, impedance matching R117.123

Radar R537
Radar antenna R537.11
Radar beacon R537.2
Radar countermeasures R537.9
Radar indicator R537.131
Radar modulator R537.122
Radar power R537.3
Radar principles R116
Radar r-f oscillator R537.121
Radar receiver R537.13
Radar scanning mechanism R537.11
Radar sets R537.1
Radar tests R537.4
Radar transmitter R537.12
Radiation, cosmic, effect on radio waves R113.413
Radiation of heat, general theory 536.33
Radiation from transmission lines R117.15
Radiation, harmonic suppression R146.3
Radiation of radio waves R111.2
Radiator, biconical type R325.84

Radiator, conical type R325.83
Radiator, pyramidal type R325.82
Radiator, sectoral type R325.81
Radio R000
Radioactivity 539.7
Radio, aeronautic applications of R520
Radio applications R500
Radio beacons, marine R512.11
Radio circuits, simple R141
Radio codes R531.1
Radio compass, marine R512.13
Radio equipment, effect of humidity R284
Radio equipment, fungus growth deterrent R284.1
Radio equipment grounding R201.5
Radio-frequency alternators R354
Radio-frequency amplifiers R363.1
Radio-frequency bridges R207.1, R244.2
Radio-frequency choke coils R217.111
Radio frequency meter R211.1, R374.1
Radio-frequency oscillators R355.911
Radio-frequency recorders R365.34
Radio-frequency resistance theory R144
Radio-frequency transformers R382.11
Radio interference R430.1
Radio marine applications R510
Radio marine navigational aid systems R512
Radio measurements R200
Radio merchandising R740
Radio methods of manufacturing R720
Radio precipitation noise R114.5
Radio principles R100
Radio processes of manufacturing R720
Radio range system, aircraft R526.11
Radio receiving apparatus R160, R360
Radio receiving sets R161, R361
Radio receiving set types R361.1
Radio relay system R480
Radio standardization R200
Radio station, broadcast frequency R613.1
Radio station, broadcast studios R613.11
Radio station, construction applications and permits R621.1
Radio station, design and planning R622
Radio station, equipment R610
Radio station, high-frequency R614
Radio station licenses R621.2
Radio station, low-frequency R612
Radio station maintenance R624
Radio station management R625
Radio station, medium frequency R613
Radio station operation R623
Radio station operator's license R621.21
Radio station regulations R621
Radio station, ship R618

Radio station site selection R622.1
Radio station, super-high frequency R617
Radio station, ultra-high frequency R616
Radio station, very high-frequency R615
Radio station, very low-frequency R611
Radio systems, connection to wire systems R450
Radiotelegraphy, history R091
Radiotelephony, history R094
Radio transmission of power R591
Radio wave propagation R112
Radio waves R110
Railroad communications R533
Range calibrator R371.6
Rates, message R531.7
Reactance R145
Reactance, capacitive R145.5
Reactance, inductive R145.3
Reactance-variation method of resistance measurement R241.2
Receiver, airways R361.119
Receiver, alignment measurement R261.9
Receiver amplifying apparatus R263
Receiver, audio-frequency section of a superheterodyne R361.102.5
Receiver, automatic frequency control of R361.215
Receiver, automobile R361.118
Receiver, batteries for radio R366.12
Receiver, broadcast R361.116
Receiver, communications R361.117
Receiver, converter-oscillator section of superheterodyne R361.102.2
Receiver, cross-modulation in R361.210
Receiver, cross-talk in R361.210
Receiver, crystal controlled R361.209
Receiver, detector section of a superheterodyne R361.102.4
Receiver, distortion in R161.7
Receiver, diversity R361.107
Receiver, features of radio R361.2
Receiver fidelity R161.3
Receiver, fidelity measurement R261.3
Receiver, frequency diversity R361.107.1
Receiver, frequency modulation R361.111, R630.25
Receiver, frequency range change R361.206
Receiver, interference output R161.5
Receiver, intermediate-frequency section of superheterodyne R361.102.3
Receiver microphonics R361.212
Receiver, Musa R361.108
Receiver noise R161.6, R361.211
Receiver, normal output of R161.4
Receiver, panoramic R361.121
Receiver, performance of individual units R261.8
Receiver, phase modulation R361.122
Receiver, polarization diversity R361.107.3
Receiver, power supply for R366
Receiver, pulse R361.123
Receiver, radar R537.13

Receiver, radio-frequency section of superheterodyne R361.102.1
Receiver, regenerative R361.103
Receiver, selectivity R161.1
Receiver, self-quenching type superregenerative R361.104.2
Receiver sensitivity R161.2
Receiver, separate quenching type superregenerative R361.104.1
Receiver, signal-to-noise ratio R361.211
Receiver, single side-band R361.106
Receiver, single-signal R361.105
Receiver, space diversity R361.107.2
Receiver, squelch, muting or quieting system R361.201.1
Receiver, Stenode R361.109
Receiver, superheterodyne R361.102
Receiver, super-high frequency R361.115
Receiver, superregenerative R361.104
Receivers, telephone R165
Receiver, television R583.5
Receiver, tone-corrected R361.109
Receiver tracking R361.213
Receiver, transmission-line tuned R361.112
Receiver, triple detection R361.110
Receiver, tuned r-f R361.101
Receiver, ultra-high frequency R361.114
Receiver, very high-frequency R361.113
Receiving apparatus R160, R360
Receiving apparatus measurements R260
Receiving equipment, radio, remote control of R367
Receiving from aircraft R523
Receiving interruptors, use of, in radio R427
Receiving on aircraft R521
Receiving set circuit arrangements R162
Receiving set measurement R261
Receiving set noise level measurement R261.51
Receiving sets R161, R361
Receiving sets on aircraft R521.1
Receiving sets, sensitivity measurement of R261.2
Receiving systems, diversity R428
Reception R160
Reception, beat R426
Reception, heterodyne R163
Reception, history of R094.2
Reception of radio waves R111.6
Reception, superregenerative R164
Recorders R365.3
Recorder, absorption, for ionosphere R365.334
Recorder, continuous, for radio field intensity R271.3
Recorder, field intensity, meter type R271.32
Recorder, field intensity, potentiometer type R271.31
Recorder, fixed frequency (h't) for ionosphere R365.332
Recorder, ionosphere R365.33
Recorder, magnetic R365.35
Recorder, manual, for ionosphere R365.331
Recorder, meteorological R365.36

Recorder, multifrequency (h'f), ionosphere R365.333
Recorder, phonographic R391.1
Recorder, radio frequency R365.34
Recorder, Scatter, for ionosphere R365.335
Recorder, signal intensity R365.32
Recorder, time signal R365.31
Recorder, wave direction R365.37
Recording, sound 681.843-
Recording, use of vacuum tubes in 621.375.613
Records, ionosphere, interpretation of R248.2
Records, ionosphere, polar spur R113.612
Rectangular array, antenna R325.111
Rectangular wave guides R118.1
Rectification R149
Rectified a-c supply for transmitters R356.23
Rectifier, copper-oxide R366.34
Rectifier, magnesium-copper sulphide R366.36
Rectifier measurements R258.1
Rectifier, non-radio 621.313.7
Rectifier, radio R366.3
Rectifier, rotary a-c to d-c R366.31
Rectifier, selenium R366.35
Rectifier tubes R337
Rectifier tubes, grid-controlled, gaseous R337.12
Rectifier tubes, hot-cathode, gaseous R337.11
Rectifier, vacuum tube R366.32
Rectifier, vibrator type for receiving set R366.33
Reemitters, radio R553.2
Reflection measurement, use of vacuum tubes in 621.375.612
Reflectors, antenna systems with R325.7
Regenerative receiver R361.103
Regulations for radio stations R621
Regulations, radio R007
Regulator, ballast resistance R366.153
Regulator, electronic, voltage, for receivers R366.151
Regulator, magnetic saturation R366.231
Regulator, neon tube R366.152
Regulator tubes R338
Regulator tubes, current R338.1
Regulator tubes, voltage R338.2
Regulators, voltage 621.314.5
Regulators, voltage, a-c R366.23
Relaxation oscillations R141.4
Relaxation oscillation, generating action of vacuum tube R133.3
Relaxation oscillators R355.914.4
Relay, keying R389.16
Relay, measurement R257.1
Relay, non-radio 621.383.21
Relay, over-load R389.18
Relay, plug-in R389.11
Relay, radio R389.1
Relay, small switching R389.12

Relay, small telephone type R389.13
Relay, stepping R389.14
Relay, time-delay R389.15
Relay, time-delay, measurement R257.11
Relay, transmitting switching R389.16
Relay, vacuum R389.17
Remote control at a fixed point R570.5
Remote control of aircraft R570.1
Remote control of land craft R570.3
Remote control of marine craft R570.2
Remote control of missiles R570.4
Remote control by radio R570
Remote control of radio receiving equipment R367
Remote control by wire R440
Repairing, radio R730
Reports, radio R009
Reproducers R365
Reproduction, high-fidelity R361.204
Research laboratories, radio R072
Research, radio R010
Resistance boxes R383.23, 621.374.2
Resistance-capacitor type oscillator R355.914.3
Resistance, contact, theory R144
Resistance-coupled a-f amplifiers R363.211
Resistance, measurement R241
Resistance measurement, bridge method R241.5
Resistance measurement by calorimeter method R241.4
Resistance measurement, reactance variation method R241.2
Resistance, radio-frequency, theory R144
Resistance type attenuators R143.1
Resistance-variation method of resistance measurement R241.1
Resistor, carbon R383.121
Resistor, composition R383.12
Resistor, fixed R383.1
Resistor, fixed, for radio receiver, measurement R264.4
Resistor, metallized R383.122
Resistor-type voltage divider R243.71
Resistor, variable R383.2
Resistor, variable, for radio receiver, measurement R264.4
Resistor, wire-wound R383.11
Resistors, R383
Resonance frequency of cavity resonator R119.32
Resonance method R211
Resonance methods in radio measurements R202
Resonance of radio circuits R141.2
Resonance, parallel, of a radio circuit R141.22
Resonance, series, of radio circuit R141.21
Resonant-cavity method of measurement R209
Resonant line coupling, impedance matching R117.122
Resonant lines R117.112
Resonator, cavity R119
Resonator, cavity, coupling to R119.35
Resonator, cavity, impedance R119.34

Resonator, cavity, modes of oscillation R119.31
Resonator, cavity, nonreentrant type R119.1
Resonator, cavity, properties R119.3
Resonator, cavity, Q R119.33
Resonator, cavity, reentrant type R119.2
Resonator, cavity, resonance frequency R119.32
Resonator, piezo R214.2
Resonator, piezo, equivalent electrical characteristics R214.21
Resonator, piezo, mechanical overtone operation of R214.22
Response, spurious, in receiver R361.208
Reviews, radio R090
Rheostats 621.317.4
Rhombic antennas R325.5
Ribbon microphone, unidirectional R385.54
Ring antenna system R321.22
Ring modulator R355.815.2
Rural radiotelephone services R546
Rules, radio R007

Sales, radio R740
Saw-toothed generator R355.914.432
Scanning beam formation, television R583.13
Scanning mechanism, radar R537.11
Science, general 507.2
Screen, fluorescent R138.313
Screen mu factor measurement of receiving tubes R262.92
Screen resistance measurement of receiving tubes R262.91
Seadromes, construction of 629.136
Secrecy equipment R423.9
Sectoral type radiator R325.81
Selective fading of radio waves R113.107
Selectivity measurement of receiving sets R261.1
Selectivity of radio receiver R161.1
Selenium cells 535.38*
Selenium rectifier R366.35
Sensitivity measurement of receiving sets R261.2
Sensitivity of radio receiver R161.2
Series resonance method of impedance measurement R244.11
Series resonance of radio circuit R141.21
Service, air mail 383
Service, commercial radio R530
Service, doctor's call R547.1
Service, lighthouse R517
Service, miscellaneous radio R539
Service, patent 347.7
Service, postal 383
Service, rural radiotelephone R546
Services, general mobile, use of radio R542
Services, radio, press R532
Services, special emergency R547
Servicing, radio R730
Sets, radar R537.1
Sets, radio receiving R161, R361

Shielding R201.5
Shielding, aircraft ignition R521.2
Shields R387.1
Shifters, phase R246.2
Ship antenna R326.23
Ship radio station R618
Short-wave antennas R326.5
Shot effect in vacuum tubes R138.2
Shunt feed a-f amplifiers R363.212.1
Side bands, vestigial R148.17
Signalling, induction 621.382.94
Signalling, marine, fog R512.12
Signalling, submarine R515
Signal intensity recorders R365.32
Signal-to-noise ratio in receivers R361.211
Signals, light 623.731
Signals, meteorological R553
Signals, navigation 534.83
Signals, standard frequency R555
Signals, time, radio R551
Silencer, tuning R361.201.1
Single side-band modulation R148.16
Single side-band plus carrier transmitter R423.6
Single side-band receiver R361.106
Single side-band transmitter R423.5
Single-signal receiver R361.105
Single-wire antenna R321.2
Site selection for radio station R622.1
Skin effect R144.2
Skip distance of radio waves R112.5
Skip fading of radio waves R113.105
Slide rules R078
Smoke detection, use of vacuum tubes in 621.375.613
Societies, radio R060
Soil, electrical properties of R282.4
Solar effects, on radio wave propagation R113.4
Solids, dielectric constant measurement R216.1
Sondes, radio R553.1
Sorting processes, by vacuum tubes 621.375.3
SOS transmitters R359.1
Sound 534
Sound equipment R263
Sound motion pictures 681.134.96*
Sound producers 681.135
Sound recording 681.843
Space charge effects in vacuum tubes R138.1
Space diversity receiver R361.107.2
Space diversity transmitter R423.22
Spark system R411
Spark transmitter R352
Spark transmitting apparatus R152
Sparkling distance R243.2
Specific inductive capacity measurement R216

Specifications, radio R051
Spectrum analyzer R371.2
Speech amplifier measurement R255.4
Speed measurement, use of vacuum tubes in 621.375.614
Spheroidal antenna R326.613
Spurious response measurement in receiving sets R261.53
Spurious response in receiver R361.208
Square wave generators R355.913.4
Squelch, muting or quieting system for radio receivers R361.201.1
Standard cells 621.374.3
Standard field generator method of field intensity measurement R271.2
Standard frequency oscillators R355.913.1
Standard frequency signals R555
Standard pulse generator R355.913.3
Standard voltage generators R355.913.2
Standardization, radio R200
Standards, electrical 621.372
Standards, frequency, piezo-electric R214
Standards, National Bureau of 353.821*
Standards, radio R020
Standing wave indicator R371.7
Static suppressors for aircraft R521.3
Station call letters, radio R531.2
Station interference R430.11
Stations, broadcast, synchronization of R423.132
Stations, broadcast R613.1
Stations, direction finding R619
Stations, FM R630.2
Statistics, radio R001
Steamships 623.823
Stenode, receiver R361.109
Sterilization of food, by vacuum tubes 621.375.41
Storage batteries 621.354
Storms, ionosphere R113.503
Storms, ionosphere, forecasting R113.617.2
Strain measurement, use of vacuum tubes in 621.375.615
Stratification of ionosphere R113.610
String galvanometer, use in measurements R242.15
Stub-line impedance matching system R117.124
Studio acoustics of broadcast station R613.111
Studio equipment, FM R630.22
Studio equipment, television R583.3
Studio technique, television R583.2
Studios, broadcast station R613.11
Sub-harmonics R146
Submarine cable 621.382.8
Submarine signalling R515
Substitution method in radio measurements R205
Substitution method of measurement of radio field intensity R271.111
Substitution method of impedance measurement R244.1
Substitution method of resistance measurement R241.3
Sun eclipse 523.78
Sunrise-sunset fading R113.106

Sunspots 523.74
Superconductivity R282.11
Superheterodyne, a-f section R361.102.5
Superheterodyne, converter-oscillator section R361.102.2
Superheterodyne, converter tubes in R335
Superheterodyne, detector section R361.102.4
Superheterodyne, i-f section R361.102.3
Superheterodyne, mixer tubes in R335
Superheterodyne, receiver R361.102
Superheterodyne, r-f section R361.102.1
Superregenerative receiver R361.104
Superregenerative reception R164
Suppressed carrier transmitter R423.4
Suppression, carrier R148.15
Suppression, harmonic radiation R146.3
Suppressors, interchannel noise R361.201.1
Suppressors, static for aircraft R521.3
Surveying, use of radio for R596.1
Susceptance variation method of measurement R204.5
Sweep circuit oscillator R355.914.431
Switch, electronic R371.51
Switches 621.317.3
Switches, antenna R320.6
Switchboards 621.317
Switching control by vacuum tubes 621.375.106
Switching, electronic R257.2
Switching equipment, measurement R257
Symbols, radio R031
Synchronization of broadcast stations R423.132
Synchronization control by vacuum tubes 621.375.107
Synchronization of scanning beam, television R583.13
Synchronizers 621.374.91
System, Armstrong, FM R423.81
System, ground R126
System, long range navigation, Loran R512.2
System, squelch, muting or quieting for receiver R361.201.1
Systems, aircraft beacon R526.1
Systems, antenna R320
Systems, antenna, capacitor type R321
Systems, antenna, directional R325
Systems, antenna, mobile R326.2
Systems, arc communication R422
Systems, communication, radio R400
Systems, continuous wave R420
Systems, damped wave R410
Systems, diversity receiving R428
Systems, duplex R460
Systems, impulse excitation R413
Systems, marine navigational aid R512
Systems, multiplex R460
Systems, public address R391
Systems, radio relay R480
Systems, spark R411

Systems, timed spark R412
Systems, vacuum tube transmitting R423
Systems, wire, connecting to radio systems R450
Systems, wire, r-f carrier R470

Tables on radio wave propagation conditions R113.74
Tables, radio R081
Tank antenna R326.24
Tapered lines R117.17
Taxicabs, use of radio by R542
Telegraph code transmitter R423.2
Telegraph, high-speed 621.382.4
Telegraph, printing type 621.382.5
Telegraph transmitters R359.2
Telegraphy 621.382
Telegraphy, ground 621.382.92*
Telemetering, use of vacuum tubes in 621.375.616
Telephone receivers R165
Telephone receiver measurements R265.1
Telephone units 621.385.97*
Telephony 621.385
Teletype R584
Teletype transmitters R359.3
Television R583
Television antennas R326.6
Television, basic theory R583.1
Television camera action R583.12
Television coverage R583.16
Television, deflection of scanning beam R583.13
Television history of R095
Television image analysis R583.11
Television image reproduction R583.15
Television plans R583.17
Television progress R583.17
Television propagation R583.16
Television receivers R583.5
Television studio equipment R583.3
Television studio technique R583.2
Television, synchronization of scanning beam R583.13
Television transmitters R583.4
Television tubes R583.6
Television by wire 621.388
Temperature control by vacuum tubes 621.375.108
Temperature controlled cabinets R214.11
Temperature effect on radio equipment R283
Tempering, by vacuum tubes 621.375.43
Terminology, radio R030
Test chamber for use at various humidities R283.1
Test chamber for use at various pressures R283.1
Test chamber for use at various temperatures R283.1
Tester, insulation R281.1
Testing, electrical 621.37
Tests, chemical, miscellaneous, use of vacuum tubes in 621.375.609

Tests, non-radio, use of vacuum tubes in 621.375.6
Tests, radar R537.4
Textbooks, radio R052
Theory of radio R100
Therapeutics R594
Therapeutic appliance interference R430.23
Therapeutics, diathermy, condenser field application R594.11
Therapeutics, diathermy, induction field application R594.12
Therapeutics, electrosurgery R594.2
Thermistor method of power measurement R245.5
Thermoelement type voltmeter R243.4
Thermoelement, use in measurement R242.12
Thickness, measurement, use of vacuum tubes in 621.375.617
Thyratron tubes R337.12
Tilt of radio waves R115.6
Time base generator R355.913.5
Time constant of radio circuit R141.23
Time-delay networks R143.4
Time-delay relay R389.15
Time-delay relay, measurement R257.11
Time, electron transit R138.5
Time interval generator R355.914.433
Time interval meter R371.3
Time measurement, use of vacuum tubes in 621.375.618
Time measuring instruments 529.78
Time signal, radio R551
Time signal recorders R365.31
Timed spark system R412
Titration, use of vacuum tubes in 621.375.619
Tone control R361.203
Tone-corrected receiver R361.109
Tone wheels R385.3, R427
Tow boat devices R514
Two-element array R325.114
Towers, antenna R320.8
Tower type antenna R321.5
Tracking in radio receivers R361.213
Traffic abbreviations, radio R531.3
Traffic, radio R531
Traffic circuit figure of merit R531.83
Traffic circuit, frequency usage R531.82
Traffic circuit, predictions of frequency usage R531.84
Traffic control by vacuum tubes 621.375.109
Traffic logs R531.81
Traffic, relation with cables R531.6
Traffic, relation with land lines R531.5
Training, radio R070
Transceivers R361.120
Transconductance measurement of receiving tubes R262.5
Transconductance measurement of transmitting tubes R252.5
Transcription turn tables R391.1
Transducers, electroacoustic, measurement on R265
Transformers 621.314.3

Transformers, audio-frequency R382.12
Transformers for communications equipment R382.1
Transformer measurements R258.2
Transformers, radio-frequency R382.11
Transformers for radio receivers, measurement R264.3
Transient effect in radio circuits R140
Transitron oscillator R355.911.22
Transmission formulas for radio wave propagation R113.75
Transmission, history of R094.1
Transmission, multipath, of ground wave R112.15
Transmission lines R117, R320.41
Transmission line antennas R125.5
Transmission lines, conduction of r-f and a-f by R117.11
Transmission lines in impedance measurements R244.4
Transmission lines, irregularities R117.13
Transmission lines, properties of R117.1
Transmission line radiation R117.15
Transmission line section, reentrant, impedance matching R117.125
Transmission-line tuned receiver R361.112
Transmission of pictures by radio R580
Transmission of pictures by wire 621.382.7
Transmission of video signal R583.14
Transmitter power supply R356
Transmitters R350
Transmitters, aircraft R522.1
Transmitters, amplitude modulation R423.7
Transmitters, arc R353
Transmitters, asymmetric side-band R423.5
Transmitters, automatic R359
Transmitters, broadcast frequency R355.131
Transmitting capacitors, measurements R253
Transmitters, condenser 621.385.95*
Transmitters, fire alarm R359.4
Transmitters, frequency control of R355.6
Transmitters, frequency diversity R423.21
Transmitters, frequency modulation R423.8, R630.21
Transmitters, high frequency R355.14
Transmitters, high-water alarm R359.5
Transmitters, low frequency R355.12
Transmitters, medium frequency R355.13
Transmitters, polarization diversity R423.23
Transmitters, pulse R351
Transmitter, radar R537.12
Transmitters, single side-band R423.5
Transmitters, single side-band, by filter system R423.51
Transmitters, single side-band plus carrier R423.6
Transmitters, SOS R359.1
Transmitters, space diversity R423.22
Transmitters, spark R352
Transmitters, super-high frequency R355.17
Transmitters, suppressed carrier R423.4
Transmitters, telegraph R359.2

Transmitters, telegraph code R423.2
Transmitters, teletype R359.3
Transmitters, television R583.4
Transmitters, ultra-high frequency R355.16
Transmitters, vacuum tube R355
Transmitters, variable carrier R423.3
Transmitters, very high frequency R355.15
Transmitters, very low frequency R355.11
Transmitters, vestigial side-band R423.5
Transmitting apparatus, arc R153
Transmitting apparatus, spark R152
Transmitting from aircraft R522
Transmitting to aircraft R524
Transmitting set measurements R251
Transmitting set, power rating R251.1
Transmitting systems, broadcast frequency R423.131
Transmitting systems, high frequency R423.14
Transmitting systems, low frequency R423.12
Transmitting systems, medium frequency R423.13
Transmitting systems, super-high frequency R423.17
Transmitting systems, vacuum tube R423
Transmitting systems, very high frequency R423.15
Transmitting systems, very low frequency R423.11
Transmitting systems, ultra-high frequency R423.16
Transmitting tubes, amplification factor R252.4
Transmitting tubes, characteristic curves R252.1
Transmitting tubes, internal capacitance measurement R252.6
Transmitting tubes, measurement R252
Transverse electric waves, TE or H R118.4
Transverse magnetic waves, TM or E R118.3
Treaties, radio R007.9
Trigger action in vacuum tubes R136
Triodes, tubes, cold-cathode R339.12
Triple detection receiver R361.110
Triplers, frequency R357.22
Tropicalization of radio equipment R284.1
Troposphere propagation of radio waves R112.2
Tropospheric wave variations R113.23
Tubes, see vacuum tubes
Tuned antenna, multifrequency R326.25
Tuned circuit frequency meter R211.21, R374.21
Tuned-grid oscillator R355.911.14
Tuned-grid tuned-plate oscillator R355.911.16
Tuned-plate oscillator R355.911.15
Tuned r-f type receivers R361.101
Tuning forks 534.3
Tuning-fork stabilized oscillator R355.914.5
Tuning indicator, receivers R361.214
Tuning of radio circuit R141.2
Tuning, push button R361.205
Tuning silencer R361.201.1
Turbidity measurement, use of vacuum tubes in 621.375.620
Turnstile antenna R321.32

Turn tables, transcription R391.11
Two-element array R325.114

Ultra-high frequency antenna R326.7
Ultra-high frequency equipment R310
Ultra-high frequency oscillator R355.912
Unidirectional ribbon microphone R385.54
Utilities, use of radio by public R541

Vacuum apparatus 533.85
Vacuum capacitors R381.16
Vacuum capacitors, measurement R215.16
Vacuum detector tube R332
Vacuum gages, use of vacuum tubes in 621.375.621
Vacuum relay R389.17
Vacuum tube circuit analysis R139.1
Vacuum tube communication systems R423
Vacuum tube cold-cathode triodes R339.12
Vacuum tube electrosurgical appliance interference R430.232.2
Vacuum tube measurements, receiving R262
Vacuum tube measurements, transmitting R252
Vacuum tube modulation devices R385.4
Vacuum tube oscillator R355.91
Vacuum tube rectifier R366.32
Vacuum tube, rectifier R337
Vacuum tube, rectifier, hot-cathode, gaseous R337.11
Vacuum tube type detector R362.2
Vacuum tube transmitters R355
Vacuum tube transmitting, amplification factor R252.4
Vacuum-tube voltmeter R243.1
Vacuum-tube wattmeters R245.3
Vacuum tubes R130, R330
Vacuum tubes, amplifier theory R132
Vacuum tubes, amplifying action R132
Vacuum tubes, cathode-ray R138.31
Vacuum tubes, characteristic curves R131
Vacuum tubes, cold-cathode R339.1
Vacuum tubes, construction of R331
Vacuum tubes, current regulator R338.1
Vacuum tubes, detector action R134
Vacuum tubes, electron emission R138
Vacuum tubes, evacuation R331
Vacuum tubes, gas R337.1
Vacuum tubes, generating action R133
Vacuum tubes, generating action with negative grid R133.1
Vacuum tubes, generating action with positive grid R133.2
Vacuum tubes, generating action, relaxation oscillations R113.3
Vacuum tubes, general properties R131
Vacuum tubes, ionization R138
Vacuum tubes in chemical tests 621.375.609
Vacuum tubes in color tests 621.375.601
Vacuum tubes in conductivity of solution test 621.375.602

Vacuum tubes in control of chemical process 621.375.151
Vacuum tubes in control of combustion 621.375.152
Vacuum tubes in control of devices 621.375.13
Vacuum tubes in control of doors 621.375.131
Vacuum tubes in control of electric load 621.375.101
Vacuum tubes in control of electroplating 621.375.153
Vacuum tubes in control of elevator levelling 621.375.132
Vacuum tubes in control of heating 621.375.4
Vacuum tubes in control of humidity 621.375.102
Vacuum tubes in control of illumination 621.375.103
Vacuum tubes in control of moisture content 621.375.102
Vacuum tubes in control of motion 621.375.104
Vacuum tubes in control of motors 621.375.133
Vacuum tubes in control of pressure 621.375.105
Vacuum tubes in control of processes 621.375.15
Vacuum tubes in control of switching 621.375.106
Vacuum tubes in control of synchronization 621.375.107
Vacuum tubes in control of temperature 621.375.108
Vacuum tubes in control of traffic 621.375.109
Vacuum tubes in control of welding 621.375.154
Vacuum tubes in counting 621.375.2
Vacuum tubes in dehydration 621.375.41
Vacuum tubes in food sterilization 621.375.41
Vacuum tubes in gas analysis 621.375.605
Vacuum tubes in gluing 621.375.42
Vacuum tubes in grading 621.375.3
Vacuum tubes in hardness test 621.375.606
Vacuum tubes in high-speed photography 621.375.611
Vacuum tubes in ignition systems 621.375.5
Vacuum tubes in ionization gages 621.375.621
Vacuum tubes in light intensity measurement 621.375.607
Vacuum tubes in magnetic field measurement 621.375.624
Vacuum tubes in metal hardening 621.375.43
Vacuum tubes in metallurgy 621.375.608
Vacuum tubes in non-radio measurements 621.375.6
Vacuum tubes in opacity tests 621.375.603
Vacuum tubes in pH measurement 621.375.610
Vacuum tubes in plastics 621.375.44
Vacuum tubes in recording 621.375.613
Vacuum tubes in reflection measurement 621.375.612
Vacuum tubes in smoke detection 621.375.613
Vacuum tubes in sorting 621.375.3
Vacuum tubes in speed measurement 621.375.614
Vacuum tubes in strain measurement 621.375.615
Vacuum tubes in telemetering 621.375.616
Vacuum tubes in tempering 621.375.43
Vacuum tubes in thickness measurement 621.375.617
Vacuum tubes in time measurement 621.375.618
Vacuum tubes in titration 621.375.619
Vacuum tubes in turbidity measurement 621.375.620
Vacuum tubes in vacuum gages 621.375.621
Vacuum tubes in vibration measurement 621.375.622
Vacuum tubes in velocity measurement 621.375.614

Vacuum tubes in weighing 621.375.7
Vacuum tubes in wood drying 621.375.45
Vacuum tubes, mercury vapor 621.327.4
Vacuum tubes, modulating action R135
Vacuum tubes, operation of R331.5
Vacuum tubes, photoelectric 535.38*
Vacuum tubes, power amplifier R334
Vacuum tubes, receiving, characteristic curves R262.1
Vacuum tubes, receiving, internal capacitance measurement R262.6
Vacuum tubes, receiving, life tests of R262.7
Vacuum tubes, receiving output power measurement R262.8
Vacuum tubes, receiving, plate resistance measurement R262.3
Vacuum tubes, receiving, screen mu factor measurement R262.92
Vacuum tubes, receiving, screen resistance measurement R262.91
Vacuum tubes, receiving, transconductance R262.5
Vacuum tubes, rectifier, grid-controlled, gaseous R337.12
Vacuum tubes, regulator R338
Vacuum tubes, relaxation oscillation R133.3
Vacuum tubes, shot effect R138.2
Vacuum tubes, space charge effects R138.1
Vacuum tubes, special applications other than radio 621.375*
Vacuum tubes, special circuit arrangements R139.2
Vacuum tubes, television R583.6
Vacuum tubes, thyratrons R337.12
Vacuum tubes transmitting, characteristic curves R252.1
Vacuum tubes, transmitting, internal capacitance R252.6
Vacuum tubes, transmitting, life tests R252.7
Vacuum tubes, transmitting, output power R252.8
Vacuum tubes, transmitting, plate resistance R252.3
Vacuum tubes, transmitting, transconductance R252.5
Vacuum tubes, trigger action R136
Vacuum tubes, ultra-high frequency R339.2
Vacuum tubes, voltage amplifier R333
Vacuum tubes, voltage regulator R338.2
Van per Pol oscillator R355.914.42
V-antenna, resonant R325.6
Variable carrier transmitter R423.3
Variable resistors R383.2
Variations, directional, of radio wave propagation R113.3
Variations, diurnal, in atmospheric radio noise R114.11
Variations, geographical in atmospheric radio noise R114.13
Variations, geomagnetic, ionosphere R113.507
Variations, latitude, ionosphere R113.505
Variations, longitude, ionosphere R113.506
Variations, normal, of ionosphere R113.615
Variations, radio wave propagation R113.2
Variations, tropospheric wave R113.23
Velocity measurement, use of vacuum tubes in 621.375.614
Velocity microphone, ribbon type R385.55
Velocity modulation oscillator R355.912.3
Velocity of radio waves R111.1
Vertical angle of arrival of radio waves R115.4
Vertical antenna combined with coil antenna R325.32

Vertical, grounded, wire antenna R321.21
Vestigial side-bands R148.17
• Vestigial side-band transmitters R423.5
Vibration measurement, use of vacuum tubes in 621.375.622
Vibrator system power supply for transmitters R356.13
Vibrators for radio receivers R366.13
Video amplifiers (wide band) R363.4
Video power amplifiers R363.42
Video signal amplification R583.14
Video signal transmission R583.14
Video voltage amplifiers R363.41
Vodas R450
Voltage amplifier, a-f R363.21
Voltage amplification measurement R255.11
Voltage amplifier tubes R333
Voltage control equipment 621.314.51*
Voltage divider R243.7
Voltage divider measurements, capacitor type R243.72
Voltage divider, resistor type R243.71
Voltage measurements R243
Voltage regulator 621.314.5
Voltage regulator, a-c type R366.23
Voltage regulator, electronic R366.151
Voltage regulator, magnetic saturation type R366.231
Voltage regulator tubes R338.2
Voltage supply, regulated d-c, for receivers R366.15
Voltmeters 621.374.3
Voltmeter, copper-oxide, rectifier type R243.5
Voltmeter, crystal rectifier type R243.6
Voltmeter, electrostatic R243.3
Voltmeter, thermoelement type R243.4
Voltmeter, vacuum-tube, use in measurements R243.1
Volt-ohmmeters R372.1
Volume control, automatic R361.201
Volume control, automatic, measurement R261.7
Volume control, manual R361.202
Volume indicators R392

Walkie-talkie R544
Watchés 529.78
Water, fresh, properties of R282.22
Water, sea, properties of R282.21
Watt-hour meter 621.374.5
Wattmeter 621.374.6
Wattmeter, vacuum-tube R245.3
Wave analyzer R371.1
Wave analyzer, heterodyne type R371.11
Wave antennas R125.2, R325.2
Wave direction recorders R365.37
Wave form analysis 537.7
Wave, guided, propagation R112.3
Wave guides R118
Wave guides, attenuation R118.7

Wave guide antennas R326.81
Wave guides, cut-off frequency R118.5
Wave guides, modes, excitation of R118.6
Wave guides, rectangular R118.1
Wave guides, non-rectangular R118.2
Wave, sky, field intensity R112.6
Wave theory, radio R111
Waves, absorption fading of radio R113.103
Waves, direct, propagation of R112.11
Waves, directional properties of radio R115
Waves, directional variations of radio R113.3
Waves, electric, transverse, TE or H R118.4
Waves, fading, of radio R113.1
Waves, flutter-fading, of radio R113.104
Waves, great-circle path, calculations R115.1
Waves, ground, absorption in atmosphere R112.16
Waves, ground, height-gain function R112.14
Waves, ground-reflected, propagation R112.13
Waves, ground, multipath transmission R112.15
Waves, ground, propagation R112.1
Waves, ground reflection effects on radio R115.5
Waves, gyrofrequency for radio R113.614
Waves, interference fading, of radio R113.101
Waves, magnetic, transverse, TM or E R118.3
Waves, modulated, theory of R148
Waves, non-great circle path, propagation of R115.2
Waves on wires R117
Waves, polarization effects on directional properties of radio R115.7
Waves, polarization fading, of radio R113.102
Waves, polarization of sky R112.9
Waves, propagation conditions, handbook of radio R113.71
Waves, propagation, ground-reflected R112.13
Waves, propagation irregularities R113.24
Waves, propagation of radio R112
Waves, propagation, solar and cosmic effects on R113.4
Waves, propagation, tropospheric R112.2
Waves, propagation variations of radio R113.2
Waves, radiation of radio R111.2
Waves, radio R110
Waves, reception of radio R111.6
Waves, selective fading of radio R113.107
Waves, skip distance of radio R112.5
Waves, skip fading of radio R113.105
Waves, sky, propagation R112.4
Waves, sunrise-sunset fading of radio R113.106
Waves, surface, propagation R112.12
Waves, tilt of radio R115.6
Waves, troposphere, propagation R112.2
Waves, tropospheric variations R113.23
Waves, velocity of radio R111.1
Waves, vertical angles of arrival of radio R115.4
Weather 551.5
Weighing, use of vacuum tubes in 621.375.7

Welding control by vacuum tubes 621.375.154
Wheatstone bridges 621.374.2
Whistlers R114.6
Wide-band antennas R326.61
Wire facsimile 621.382.7
Wire, remote control by R440
Wire systems, connection of radio systems to R450
Wire systems, r-f carrier R470
Wire-wound resistors R383.11
Wires, parallel R117, R320.411
Wires, waves on R117
Wood drying, by vacuum tubes 621.375.45

X-rays 621.375.623
X-ray tubes 621.327.7

Yagi array R321.341

